JULY 1953

News Magazine of the American Standards Association, Incorporated

INDUSTRY VISITS AIR FORCE

Company Men See Standards in Action Looking over B-47 bomber (above), industry executives, members of ASA Company Member Conference, had first-hand view of how Air Force operates. This was only one of the interesting experiences during CMC visit to Wright-Patterson Air Force Base.

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Marginal Notes

What to Look for Next Month in the August Issue—

A new gaging standard for involute splines is the immediate reason for an article that explores the basic concept of the 1950 American Standard for involute spline dimensions. George L. McCain of the Chrysler Corporation and Albert S. Beam of the Vinco Corporation have analyzed the way these two standards are to be used and how they fit together. Mr McCain is vice-chairman and Mr Beam a member of the subcommittee which developed the new standard. The gaging standard represents a relatively new approach to these problems, they explain. Arrangements are being considered to make reprints of the article available to those interested.

Everyone who drives a car and expects to travel abroad will be interested in the discussion of the new United Nations system for highway signs and markings. H. E. Hilts, Deputy Commissioner of the Bureau of Public Roads and a member of the Highway Traffic Standards Board, has prepared an analysis of these new international signs and how they compare with those used in this country.

A description of the new standard connections that will make it impossible to connect the wrong gas cylinder to equipment used in hospitals will also be published in August.

New Feature on Government Standards—

A monthly feature on new developments in standards, specifications, item identification, and inspection in various levels of Government—Federal, state, county, and city — will start in September.

The articles will be written by Samuel P. Kaidanovsky, former chairman of the Federal Interdepartmental Standards Council, Technical Consultant of the Federal Specifica-

tions Board, and editor of the STANDARDS WORLD.

It is expected that such continuous information will result in better knowledge by industry of Government achievements in the field of standardization, the more extensive use by the Government of industry or technical society standards and specifications, and may lead to better understanding and cooperation between industry and Government with savings to both.

Our Apologies—

To our chagrin a number of inaccuracies have been noted in the June issue of STANDARDIZATION. In the "Marginal Notes" we called attention to the article on protection against lightning by John A. Dickinson (see page 209 of this issue). We mistakenly gave Mr Dickinson credit for serving as chairman of the sectional committee which developed this standard. We apologize to W. W. Lewis of Schenectady. Mr Lewis has served as chairman of the Sectional Committee on Code for Protection Against Lightning since 1941. Mr Dickinson is secretary of the committee.

Our apologies also to Mr Wiggin, author of the article, "Through Research to Standards on Cast-Iron Pipe" (page 168 of the June issue). Mr Wiggin offers a number of revisions to the note about his present activities and his chairmanship of Sectional Committee A21. He is consultant not only to companies formerly in the group covered by the Federal Water Service Corporation (no longer in existence) but also to a number of other waterworks. He was chairman of Committee A21 from the time it was first organized in 1926.

Our Cover Photo is an official U.S. Air Force Photo

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Standardization

Formerly Industrial Standardization

ASA

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Standardization is dynamic, not static. It means not to stand still, but to move forward together.

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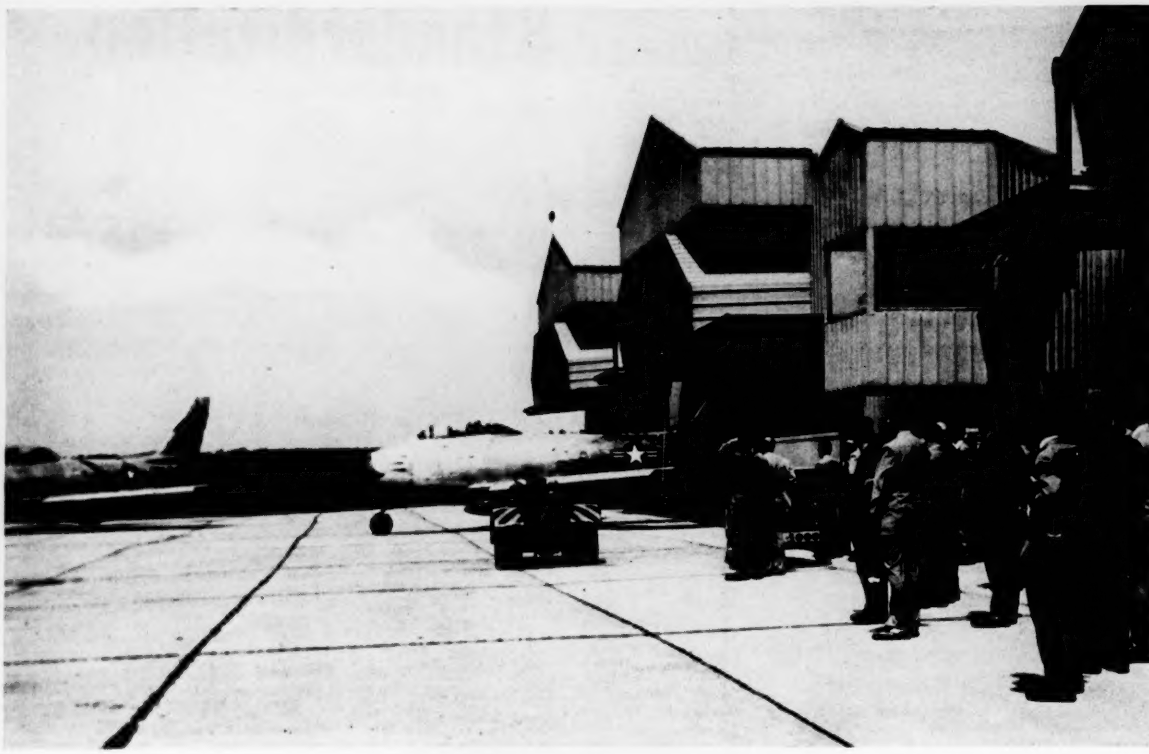
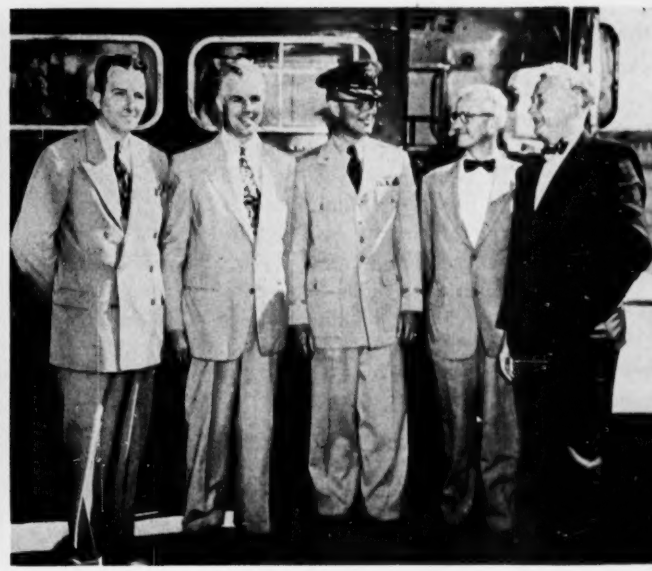


Above—Through the courtesy of the U.S. Air Force, members of the Company Member Conference paid a two-day visit to the Wright-Patterson Air Force Base. The occasion was the spring meeting of the Conference, May 25 and 26. Here, CMC members are watching Sabrejet planes of Wright Base Interceptor Squadron being readied for flight. These Sabrejets form one of USA's important lines of defense. When an unidentified plane is spotted by radar or civilian air patrol, runways are cleared and Sabrejet pilots alerted by signal from central control tower to hangar control room (shown in center of picture). CMC members were amazed at the speed with which pilots get planes off ground after signal is given.

At right—Pilot of Wright Base Interceptor Squadron stands on wing of his Sabrejet plane to explain to CMC members how the plane operates.

All photographs used in connection with this article are official U. S. Air Force Photographs.



Above, left—Colonel R. L. Elliott, Jr, Commanding Officer, welcomes K. B. Clarke, (Western Electric), chairman of the Conference, and W. P. Fleming (Jeffrey Manufacturing), vice-chairman, to the Gentile Air Force Depot. S. H. Watson, past chairman, is at left. Above, right—With Colonel Elliott, center, are (left to right) S. H. Watson, Victor Division, RCA, past chairman of CMC; M. C. Olsen, National Cash Register Company, Dayton (in charge of meeting arrangements); Colonel Elliott; W. P. Fleming, vice-chairman of CMC; KenClarke, CMC chairman.

Company Conference Visits Air Force

TAKING as its theme "Air Force and Industry — Their Mutual Standardization Problems," the Company Member Conference paid its second visit to a military establishment at its spring meeting, May 25 and 26. The meeting was held at the Wright-Patterson Air Force Base at Dayton, Ohio. The first visit of this kind was to the Norfolk Naval Base, Norfolk, Virginia, at last spring's meeting.

During their two-day visit, members of the Conference toured the Air Force Base. They were shown how the 97th Fighter Squadron operates and were given demonstrations of the way its F86E Saberjet planes are used for the defense of the U.S. They were particularly interested in the latest equipment used by jet flyers—flying "G" suit with parachute, life preserver, helmet, eye protection, and special inflation facilities.

They visited the Flight Testing Facilities of the Wright Air Development Center where B47 bombers are used to flight-test newly developed equipment after it has been proof-tested in wind tunnels and with other testing devices, and before it is put into production.

The CMC members were also shown the radar facilities used for ground control of blind landings.

The second day's visit included a tour of the Gentile Air Force Depot, center in the east for procurement, storage, maintenance, and distribution of airborne electronic equipment used by the U.S. Air Force.

K. B. Clarke, assistant superintendent of manufacturing engineering, Western Electric Company, New York, and chairman of the Company Member Conference, presided at the formal meetings. These were held in the auditorium of the Air Materiel Command.

Louis Polk, president of the Sheffield Corporation of Dayton, Ohio, and vice-president of the American Ordnance Association, gave the opening address (see pp 203-207). The first day's formal program included talks that covered the engineering aspects of standardization in development of new equipment and the functions of the Air Materiel Command, including cataloging, item identification, and standardization in supply, maintenance, and procurement. The second day was devoted to the Gentile Air Force Depot, one of the great supply depots operated by the Air Materiel Command.

Summaries of the talks and the questions and answers that followed are given below.

Engineering Aspects of Standardization in Development. Colonel J. J. Smith, Director of Engineering Standards, Wright Air Development Center.

Standardization activity within the Air Force started as early as 1917,

NOTE: The Company Member Conference is indebted to M. C. Olsen, National Cash Register Company, Dayton, Ohio, for handling arrangements for this meeting, as well as to the Air Force for its hospitality.

and up to the end of World War II a total of 1400 AN (Army-Navy) standard drawings and 800 AN specifications had been prepared. The *Air Service Engineering Handbook*, prepared in 1922, devoted 47 pages to standard parts, including standards pertaining to aircraft engines. The advent of naval aviation emphasized the need for cooperation between the services and the resulting cooperative efforts brought about the development of AN and Military Aeronautical standards. These standards contributed significantly to the high level of mass production which was a major factor in the successful conclusion of World War II.

Certain Air Force equipment must meet unusual conditions of temperature and humidity and therefore requires special specifications; however, the policy of the Air Force is to use non-governmental standards in the preparation of specifications provided they satisfactorily meet Air Force requirements.

The Air Force has its own drafting manual, but it is also cooperating with the other services to bring about greater standardization of drafting practices among all the military services. The basic handbook for designers of aircraft for the United States Air Force is the *Handbook of Instructions for Aircraft Designers*. This book includes many standards which experience in production, maintenance, and operation of aircraft have shown to be sound. These are followed in the design and construction of new aircraft wherever applicable. Two other handbooks are now being prepared—a *Designers' Handbook for Ground Equipment*, and, *Guided Missiles*.

The Mission of the Air Materiel Command. Colonel W. E. Sault.

Colonel Sault used slides to explain the mission of the Air Materiel Command. This Command provides material support for the Air Force through purchase, storage, and supply of equipment. Its work is divided into three parts: (1) maintenance engineering; (2) supply and services; and (3) procurement and production.

Its field work is carried out through (1) depots, and (2) procurement districts.

A total of 16 Air Depots are located in the various zones into which the Command has divided the country. Eleven of these are for supply and maintenance; 5 for supply only. A hypothetical line divides the east from the west, roughly along the Mississippi River. It is intended that facilities in the three eastern zones shall duplicate those in the five western zones.

The air procurement districts are based on the centers of industry which supply the equipment and materials in which they are interested.

Cataloging and Standardization. Colonel W. M. Miles.

Modern military supply management has become one of the biggest of modern business enterprises. To carry on this business efficiently, therefore, it is imperative that supply cataloging and standardization programs be uniform. The Air Base is working under Law 436 "Defense Cataloging and Standardization," passed by the 82nd Congress in July 1952. According to the policy of decentralization it lays down, detail operations for positive item identification and item interchangeability have been made the responsibility of the Air Force Depots. The Air Force collaborates with the Army, Navy, and Federal Supply Service, and with other Federal agencies, and cooperates with industry in the problem of cataloging.

The Air Materiel Command is concerned with more than 1 million items. This large number of items presents a serious cataloging problem, compared, for example, with that of the average Sears, Roebuck catalog which contains about 100,000 items.

Cataloging, Item Identification. C. L. Dahm, Civilian Chief, Cataloging Division.

Two government cataloging programs that affect the work of the Air Force are being coordinated. These two programs are (1) the Federal or Department of Defense Cataloging and Standardization Program, and (2) the Air Force Supply Cataloging and Supply Standardization Program.

One of the principal objectives of the coordination program is to decide on only one name and one number for each item. In all, some 3½ million items must be considered.

In carrying out this program the following steps are being taken:

(1) Compile dictionary. This necessitates the picking of a

Colonel J. J. Smith, Director of Engineering Standards, Wright Air Development Center, gave the history of its engineering standards and told how standardization is being applied in development of new aircraft.

More than 1 million items must be cataloged for the Air Force, said Colonel Wm M. Miles, chief, Cataloging and Packaging Division.

name for each item in order that there may be a standard language.

(2) Prepare description patterns in order that each item may be properly described.

(3) Establish standard procedure and method for the description of items.

(4) Assign a number to each unique item.

From 200 to 400 people have been working on this problem since 1947. Some 45,000 names have been approved and 1,300,000 item descriptions have been written.

In cooperation with the Army and Navy, a particular area of items is considered at one time. After there has been agreement concerning this area, an effective date is established. After that date, the items are converted to the new descriptions and numbers. Some of this conversion is due to start in July. It is hoped that all items will be converted to this new system by the end of the 1957 fiscal year.

In cataloging the items of equipment and components it purchases, the Air Force hopes to make available a catalog for industry to use in working on new designs and new equipment for the Air Force. This should make it possible for industry to use standard parts as far as possible and thus cut down on specials.

Since there will always be new developments and improvements in items, Mr Dahm suggested that a number assigned to a piece of equipment or component should continue to be used on any further development of the item as long as the part continues to be interchangeable. As soon as a change in a part prevents further interchangeability with older parts, then a new number should be assigned to the latest development, he said.

Mr Dahm hoped that in the future it might be possible for the Air Force to obtain a written item identification from industry whenever it purchases a new item. This would not only save the Air Force additional work but would also mean that the identification would be prepared by those who are most familiar with the item being described, he explained.

Standards and Standardization in Supply, Maintenance, Production, Procurement, and Quality Control. D. A. Byrum.

Under the provisions of Public Law 436, the Air Force is participating in the Department of Defense Standardization Program. In addition, the Air Force is continuing to participate in the program of the Bureau of Aeronautics and the Council for Military Aircraft Standards.

Public Law 436 has assigned the standardization function to the Defense Supply Management Agency. Its program of standardization has the objective of increasing the combat effectiveness of the military forces; and to conserve money, manpower, time, production facilities, and materiel resources. This program aims at elimination of overlapping and duplicating item specifications; reduction in number of sizes, kinds, or types of generally similar items; and standardization in methods of preservation, packaging, packing, and marking of military supply items.

The Defense Supply Management Agency determines the areas for standardization activity and assigns projects to the various military services, bureaus, or commands. DSMA then approves and promulgates the completed standards.

Under Department of Defense Directives, all existing departmental, bureau, service, or activity standards and specifications are to be converted to conform with the Military or Federal series, or are to be canceled, by July 1955. Items that are repeatedly required by one or more of the military services are to be included in the Federal Supply Catalog. It is hoped that minor variations can be eliminated and standard items used among the three services as far as possible. This will help reduce the total number of items required.

To date, standardization action has been confined mainly to the areas of household furnishings and clothing. It is expected, however, that within the next few years every major area of materiel purchased by the Department of Defense will be considered under the standardization program.

For example, in the past there have been specifications for 24 different types and sizes of bed blankets. As a result of standardization, this total has now been reduced to 7. Four of these are required for medical use only.

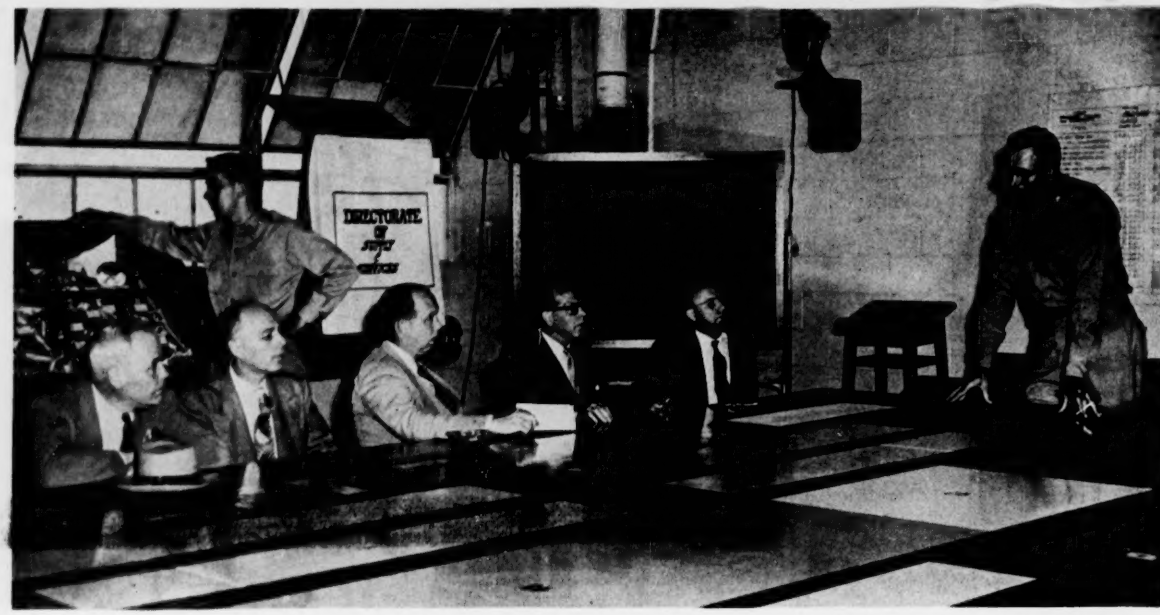
Military specifications are prepared and issued in accordance with the *Manual for Military Specifications.* The current edition of this *Manual* was issued by the Defense Supply Management Agency on December 8, 1952. A similar manual on military standards is now being prepared by DSMA. This manual, to be entitled, *Manual for Military Standards*, will be issued soon. These two documents will govern the preparation and promulgation of military specifications and standards.

Military Standard MIL STD 129, published on August 9, 1951, for example, covers marking of shipments, including both interior packages and exterior shipping containers. This standard superseded more than 10 separate documents which had been in use in the various services, bureaus, and activities.

Military Standard MIL-I-8500 on Interchangeability and Replaceability of Component Parts for Aircraft (including Guided Missiles) is now being put into effect by the military services and the Civil Aeronautics Administration. It provides that production parts for a certain model of aircraft be standard and applicable to all aircraft of that model, irrespective of the number of contractors or subcontractors engaged in its production.

Personnel of the Air Materiel Command, with personnel of the Air Research and Development Command, are also taking steps to standardize requirements for manufacturers' drawings and the numbering of them. At the present time, the Air Force uses four different specifications covering drawing requirements. These are:

(1) Specification MIL-D-5028. This covers preparation of drawings and data lists for



Conference table at Gentile Depot is built to scale and shape of Depot property. All buildings are indicated (lightest sections completed; darker outlines to be added). Scale mock-ups are used to plan efficient handling of materials.

engines, accessories, and other auxiliary equipment.

(2) Specification MIL-D-5481. This covers the preparation of drawings and data lists for production of aircraft.

(3) Specification MIL-D-8513. This covers the preparation of drawings and data lists for special support equipment.

(4) Air Force Specification 40952.

Major James H. Ridling, Director of Supply, Gentile Air Force Depot, used charts to show how the Air Force handles supplies of airborne electronics and test equipment.

This covers the preparation of drawings and data lists for communication and electronic equipment.

Comments and suggestions will be welcome. They should be addressed to the commanding General Headquarters Air Materiel Command, attention MCSI, Wright-Patterson Air Force Base, Ohio. Copies of the standards and specifications mentioned above can be obtained from the Commanding General, Wright Air Development Center, attention WCXEP, Wright-Patterson Air Force Base, Ohio.

Questions

Q. What is the present status of Military Standard MIL STD 7911?

A. The Air Force has already canceled this standard and it is expected that the Navy will cancel it by September.

Q. What happens when a specification supersedes 6 or 8 others? Are your drawings brought up to date to show the new specification?

A. It takes a long time to bring the references up to date on all of our drawings. We do this first by general references, and later try to bring the drawings up to date.

Q. Will there be an index to these standards?

A. There will eventually be a 4-volume index.

Gentile Air Force Depot.

Colonel R. A. Elliott, Jr. Commanding Officer of the Gentile Air Force Depot, welcomed the Conference members. He was pleased, he said, that officers of the Depot could have this opportunity to discuss supply, procurement, and maintenance problems with representatives of industry, he said.

This is an electronics depot, directed by Air Materiel Command Headquarters, Wright-Patterson Air Force Base, through the Middletown Air Materiel Area, Olmstead Air Force Base, Middletown, Pennsylvania, he explained. The Depot covers approximately 163 acres and has some 950,000 square feet of inside storage space. It is now being expanded so that it will eventually provide $1\frac{1}{2}$ million square feet of covered storage space.

Its primary responsibility is for procurement, storage, maintenance, and distribution of airborne electronic equipment. In addition, it fabricates crystals for electronic equipment, and is responsible for certain Air Force test equipment.

One of the principal standardization problems of the Depot has been in connection with fabrication of crystals. Its standardization work is carried out in cooperation with the Army and Navy. Standard procedures are now being developed. Facilities for fabrication of crystals have been installed and are being maintained to take care of emergency requirements which may develop for certain types of crystals. Most of the

crystals used by the Air Force are obtained from industry, however.

Air Force Airborne Electronics. Major James H. Ridling, Director of Supply, Gentile Air Force Depot.

For Air Force purposes, the whole world has been divided into two zones, roughly separated by the Mississippi River. The Gentile Air Force Depot provides electronic supplies for the eastern zone; a similar depot in San Antonio provides similar services for the western zone. This is the primary depot for 14 classes of property covering some 150,000 separate and distinct items for use with the following: electrical terminals; electrical connectors; lamps and fuses; airborne radio; airborne radar equipment; radio and radar maintenance parts; radio crystals; capacitors; coils and transformers; switches; tubes; relays; electrical insulators and knobs; test equipment and precision gages.

Many procurement problems arise in obtaining test equipment, Major Ridling said. When a new aircraft is developed, a number of steps are taken: (1) a general idea is conceived, for a faster plane, for example, as in the case of the B52; (2) procurement is initiated, first, for design development, and second for production; (3) the design is placed on the drawing board; (4) the design is approved; (5) the test equipment is developed.

Test equipment may be electronic, hydraulic, or mechanical. Its purpose is not only to make the necessary tests on the new plane and its components to assure efficient operation but also to calibrate and to maintain the equipment on the plane.

A number of methods may be followed in determining procurement requirements. In some cases higher authorities instruct the Depot to procure a certain item. In other cases Depot personnel estimate as best they can what the demand for replacement parts may be on new planes or other pieces of equipment as they are being designed and developed. Very frequently they confer with the manufacturer who has developed a new product in order to prepare a list of the replacement parts and components that should be carried in stock. Their goal is, wherever possible, to assure concurrent deliveries of supply items and of the major article with which they are concerned.

CMC members inspect old communication test equipment received by Gentile Depot for either repair or disposal.

In the supply problem they are concerned with obsolete equipment. Equipment may be declared obsolete because it has been replaced by a new item. It may also be declared obsolete because records show there has been no demand for it over a given period of time.

Whenever any item is declared obsolete, there is a definite program for its disposal. First, the item is offered to other agencies of the government which may be using it. Then, if items are still available, they are offered to civilian activities, such as colleges, for use in programs with which the Air Force is cooperating. Third, if items still remain, they are disposed of either by reclamation and salvage or they are destroyed.

Three of the Depot's major problems are: how to determine the useful life span of equipment; how to develop an approval system for new equipment without waiting for the development of test equipment; and how to assure the interchangeability of bits and pieces. The number assigned to parts and pieces by the original manufacturer would be more valuable than the stock number of the manufacturer who finally assembled the whole equipment. The Depot would then be able to identify the same parts and pieces even though they might be used in half a dozen different kinds of finally assembled equipment.

Questions

Q. Will the military standards and commodity classification system help you in your work?

A. Definitely this will be a help. In the past it has been difficult to make sure that we are not carrying the same item under duplicate numbers and classifications.

Q. What percentage of components are interchangeable?

A. The best item as far as interchangeabil-

ity is concerned is resistors. About 60 or 70 percent are interchangeable. Other items are not quite so good.

Q. Does the Air Corps assign its own part numbers?

A. As far as the aircraft itself is concerned, the Air Corps does assign its own number, but for electronic equipment, it uses the manufacturer's number.

Q. In line with the tendency in airborne equipment to use small light-weight items, will certain of the older airborne equipment become obsolete for use in the air but still be serviceable for the ground equipment or for the Army or Navy?

A. This frequently happens. In the past some equipment has been purchased on a performance basis, and therefore, there has been little control of the standardization of parts and pieces. The Air Corps is now trying to get away from this in order that standard parts and pieces will be used in as much equipment as possible.

Q. Do different manufacturers of radio tubes use the same part number for the same or interchangeable tubes?

A. Yes, they do, because of the JAN specification which provides for the numbering of tubes. We are far better off on the numbering of tubes than on many other items of equipment.

S. H. Watson, RCA:—The Radio and Television Manufacturers' Association, for example, is assigning numbers to certain tube designations. This also helps in this problem.

Q. Does the Air Corps have a list of standard bits and pieces that are now being used, so that a contractor making something new can incorporate them into his new design?

A. It is very difficult to make up such a list at the present time; however, we recognize the value of such a list if it can be made up.

Q. How do you make up the list of spare parts and the numbering for each part required for some new piece of equipment?

A. The best we can do is to ask for the recommendation of the contractor who made the equipment in order to provide a list of parts needed to operate the equipment for at least one year. The Air Force uses the terms "spare parts" and "bits and pieces" with a distinct difference in meaning. Spare parts may be considered as "parts peculiar" and "bits and pieces" might be considered as "parts common."

Gentile Procurement Cycle. Major James F. Greenwood, Director of Procurement, Gentile Air Force Depot.

At the Gentile Depot there are about 100 employees engaged in procurement activities, of whom about 25 are buyers. This Depot arranges for procurement of about 100 million dollars worth of equipment per year. Procurement has to be conducted in accordance with the public laws which provide that all interested organizations must be given a chance to bid. For certain types of procurement, special considerations have to be given to "small business," "defense small business," and "labor distress areas."

The complete cycle of procurement from the time an item is first wanted until the contract is signed, including advertising, receipt of requests for permission to bid, preparation of documents necessary for a manufacturer to prepare a bid (bid sets), receipt of bids, review of this material, evaluation of bids, negotiation of special points, investigation of contractors, and placing of the contract requires about 113 days.

All manufacturers who prepare bids should read all the material, including the fine print on the bid sets. Manufacturers are permitted to take exception to the proposals of the Government. This sometimes makes it possible for a manufacturer to give a much lower bid than otherwise might be possible.

Questions

Q. What is the definition of "small business"?

A. This is set by another agency. At present a "small business" is considered to be any plant employing less than 500 people.

Q. Some of the specifications are quite satisfactory to the manufacturer, but packing specifications sometimes seem to be excessive.

A. The Depot recognizes that work has to be done on the subject of packing specifications.

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At the business meeting, plans for future programs were discussed. It was suggested that an interesting program might be built around a single standardization problem. Any one who would like to have a general CMC discussion of a special problem is invited to send the suggestion to the chairman.

Members of CMC who care to discuss their suggestions for a CMC program personally with a member of the Administrative Committee nearest them are invited to do so.

MEMBERS OF CMC—

Send your suggestions for future sessions to the Chairman of CMC. Address them to:

K. B. Clarke
Assistant Superintendent
Manufacturing Engineering
Western Electric Corporation
195 Broadway
New York 7, N. Y.

Or you may prefer to discuss them personally with the member of the CMC Administrative Committee nearest you. Their addresses are:

R. G. Cummings, H. T. Kennedy Co, Basso Building, 7338 Woodward, Detroit 2, Mich; L. M. Dalcher, Standards Engineer, Beloit Works, Fairbanks, Morse & Co, Beloit, Wis; W. B. Fleming, Jeffrey Manufacturing Co, East First Ave, Columbus, Ohio; P. L. Houser, General Supervisor of Manufacturing Standards Research, International Harvester Co, 5225 South Western Blvd, Chicago, Ill.; B. H. Jorgenson, Tennessee Eastman Co, Division of Eastman Kodak Co, P. O. Box 511, Kingsport, Tenn; W. H. Kiler, Principal Standards Engineer, Engineering Department, Standards Section, E. I. du Pont de Nemours & Co, Inc, Nemours Building, Wilmington, Delaware; R. A. Miller, Technical Sales Engineer, Pittsburgh Plate Glass Co, 2000 Grant Building, Pittsburgh 19, Pa.; J. J. Schmidt, Field Superintendent, The East Ohio Gas Co, Cleveland 14, Ohio; W. S. Scott, Metallurgist, Republic Steel Corp, Cleveland 1, Ohio; J. L. Walker, The Texas Co, 122 East 42nd Street, New York 17, N. Y.; S. H. Watson, Standardizing Division, Radio Corp of America, RCA Victor Division, Camden, N. J.

AIR FORCE AND INDUSTRY —
Their Mutual Standardization Problems

by Louis Polk

President, The Sheffield Corporation; Vice-President, American Ordnance Association

Address presented at the opening session of the Company Member Conference meeting May 25-26, Wright-Patterson Air Force Base, Dayton, Ohio.

THE world has seen many important and useful discoveries: the use of fire; the alphabet; invention of the wheel; printing; steam and electric power; atomic energy. There are two others, though—really twins—that possibly provide the foundation for all industrial progress.

One originated when some primitive man ages ago first learned to measure; in a sense he founded engineering. Naturally, this necessitated the establishment of standards where measurement is the basic element. These two—measurement and standards—are twin keys to the progress that has made possible today's industrial civilization. Abolish them, "measurement and standards," and there would be chaos. Whenever we express distance, time, or temperature, or volume, or weight, or motion, . . . or even emotion . . . we are measuring and comparing. Measuring, essentially, is comparing an unknown with a known standard; it really doesn't make much difference how long an inch is so long as it means the same length for all of us.

In production we have only two choices: to use standards, or to make everything special; and no one need remind us what "specials" mean to costs.

In considering the relationship of standardization to aircraft, it is important that we not forget the relative newness of man's flying. Certainly our flying craft have passed the relative development stage of the Mayflower in the days of our Pilgrim fathers. Nevertheless, aircraft development is a long way from approaching that stage where future progress might come at a less accelerated rate and be replaced to a degree by refinement rather than revolutionary new design. Thus we have seen biplanes give way to monoplanes. We are witnessing the development of rotary wings. We've watched straight wings be challenged by swept-backs. And now piston engines are successfully challenged by turbines. In such a stage of development, there are, of course, many problems; that's just par for the course. In this field, especially difficult conditions make the course rougher and tougher; and research and development move with lightning speed and affect the entire industry. The problem is further complicated because the biggest customer is the Government. Understandably, this does not permit the flexibility found in some sections of private industry.

Moreover, standardization is even more important in the aircraft industry because national security, our lives, and our homes, depend upon the ability to keep pace with these fast-changing developments, while at the same time the industry must be able to produce aircraft components and accessories in great volume. Understandably, the military must primarily emphasize such factors as speed and weight versus horsepower, maneuverability, range, climb rate, service life. Concessions may be made on comfort, appearance, and, to a degree, on safety and cost. The problems of standardization become even more important than to civilian users for they include armament and firepower, outshooting and outflying the enemy, as well as logistics. As has been said, there is no satisfaction in being the "runner-up" in a war.

Naturally, in research and development, initial aircraft standards were largely general in nature and related primarily to the end performance of the craft as being the test of acceptance of either design or plane, rather than emphasizing standardization of specific physical dimensions or weights of individual parts. Performance standards remain the only practical approach in aircraft research and development.

By setting such standards a little higher than the results actually expected, tremendous progress has been achieved.

A further form of standardization is that of planes for specific types of missions. Thus, at one period or another, for a variety of purposes, certain types of plane designs have been standardized to provide various kinds of fighters; all-weather ships; light, medium, and heavy bombers; supply, transport, and reconnaissance planes. This type standardization has permitted the rapid expansion of building facilities in the same, or separated, plants to secure needed kinds and quantities of aircraft at desired quality, if not at desired costs.

Louis Polk, president of the Sheffield Corporation, Dayton, Ohio, is vice-president of the American Ordnance Association.

While type standardization was an important step in the right direction, the further experience of general industry suggests that the current continued development of specific physical standards for parts, sub-assemblies, and assemblies will continue to leaven the loaf constructively.

The Services are particularly charged with this responsibility. Industry generally, and the aircraft industry specifically, realizes that such definite physical standardization of parts and components moves nearer to the ultimate in reducing lead time, shortening delivery and manufacturing cycles, and utilizing more unskilled labor.

This affects different companies differently, and it is desirable to remember that aircraft manufacturers range from those exclusively producing complete aircraft and accessories to those civilian manufacturers who only enter the industry in defense periods.

Most of the aircraft industry's output goes to the military, but there is also a civilian commercial interest in producing extremely safe and economic planes at proper costs. In this case other factors, such as appearance and comfort, market, public reaction, become paramount rather than the factor of dealing with an enemy on a life or death basis. All these factors influence the problems of standardization; in all history there is no ending to the conflict among research, engineering, and production.

In final production and engineering, to shorten manufacturing and delivery cycles and minimize costs, we must continue taking seven-league steps in standardizing specific items that go to make up the flying ship and its accessories.

Positive steps continue to be taken to lessen standardization difficulties and bring about better cooperation and coordination.

The duties of the Defense Supply Management Agency include avoiding duplication and variability while developing military standards and specifications. There are 20-some major producers of aircraft in our country, and their major standardization effort is being coordinated through the National Aircraft Standards Committee with the cooperation of the Air Force and the Naval Bureau of Aeronautics. This official representative of the aircraft industry meets regularly, and its standards are recognized as acceptable for use by the Armed Forces. Additionally, such a standard is often adopted by the Government.

This kind of practical teamwork is accelerating the more specific type of standardization, dealing not only in individual planes and their components, but in common items for different type planes. A simple example is standard screw threads. In many cases they are the same, whether we think in terms of fighters or bombers. Then there is the possible standardization of some parts that are peculiar to certain planes or power plants. An example is the multi-volume jet blade in turbines.

"The avoirdupois pound was first established in England by Edward III in 1340, and was originally used for weighing wool. From 1588, in the reign of Elizabeth, it was established on its present basis of 7,000 grains to the pound." —*Fifty Years of British Standards.*

These blades probably will lend themselves to groups of standardized forms and sizes; provided that first we determine what the best design or form and size is for a given purpose, then what the practical manufacturing tolerance should be, and then define an actual final positive locating or datum point rather than a theoretical one suspended in space. It is well to remember that until we can express what we want in definite figures, we can't know where we've been, or where we are, or where we're going. And that's true whether we think in terms of product or engineering, or research, or inspection, or quality control, or manufacturing, lead times, performance, interchangeability, servicing, supply, or maintenance.

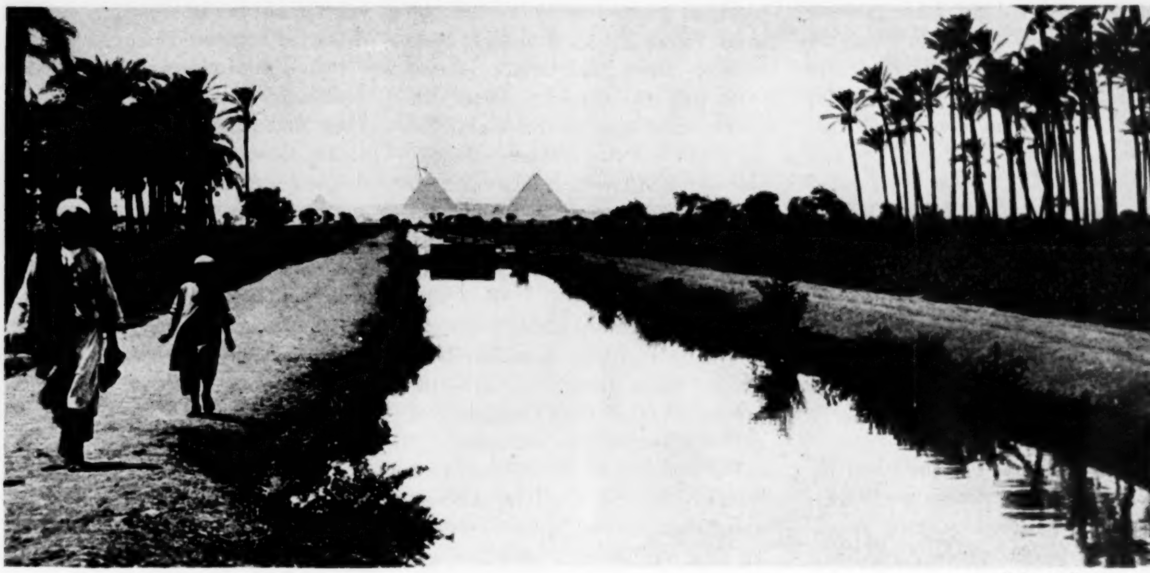
Thus, while it is imperative to accept aircraft on the basis of a plane's general performance, I respectfully agree that now is the practical time, from the standpoint of manufacturing and over-all operating and maintenance also to consider including in aircraft procurement the present further expanding standardization of specific parts and components. Lack of specific standardization encourages "fit and try" assembly rather than uniform controlled low cost interchangeable manufacturing.

Interchangeability becomes mighty important in maintenance and in provision of adequate stocks all over the world. Parts cannibalization may mean the difference between saving lives, or winning or losing a position, a battle, or a war.

Even in final engineering design there is a rule of reason in the establishment of specific physical standards. Experience has taught and shown many progressive old industries that it is highly desirable to utilize standardized components in making up finished products. Whether we think in terms of electric motors, refrigerators, automobiles, or what not—we see a high degree and variety of standardization in the procurement and manufacture of generators, batteries, ball bearings, nuts and bolts, refrigerator trays, even major items such as automotive carburetors and bodies, as well as key parts.

We've already suggested there are problems involved. We've mentioned the necessity to avoid freezing progress in a new field and the possibility of tramping on the toes of sacred cows and elephants. Problems such as these are not insurmountable and steps undertaken confidently now give additional tremendous further impetus to aircraft standardization.

Lip service to unification isn't enough if the engineering drawings of one country are to be turned over to another for production while a third nation, having poor production facilities but large manpower, is expected to use the manufactured equipment. An example is the approach to common engineering standards for measuring screw thread bolts, limits, and fits, in the ABC countries. This work has been under way a long while. The



Ewing Galloway, N. Y.

Where Nile waters make cotton fields and date orchards bloom. Early Egyptian farmers developed geometric method for relocating farm boundaries after Nile floods. Pyramids are ancient example of man's use of standard measurements.

modern integrated American screw thread system was started at the close of World War I. It has been expanded, revised, and corrected to keep pace with the development of new mechanisms, new production and assembly devices, and the need for a single unified thread system for all countries using the inch. Today the National Bureau of Standard's Handbook H-28 and Supplements and the American Standard B1.1, containing the Unified and American Standards for screw threads, have been accepted and are being used almost exclusively by the Services and industry. That's progress.

But the present problem now is not with the base standard. It is with the manner of adherence to that base standard. Originally only thread rings were available for checking external threads. Today there are 12 different methods in use.

Each was developed for a particular purpose and possibly serves it well. However, from the thread ring, which provides a cumulative check on all thread elements, to the more recent checking methods utilizing wire or ball points or rotary edges which check only pitch diameters, there is a wide difference in result. These findings cannot all be interpreted the same way, for parts accepted by one method may be rejected by another. A single master standard for correctly interpreting these several methods is needed.

For many years I have said that man's industrial progress has been paced by his increasing ability to divide or split the inch finer and finer. Today I'd like to bring that up to date by saying that man's industrial progress has been paced by his increasing ability both to measure better and to standardize more.

Even in the days of Noah some form of measurement standards existed and were used to build the Ark. In the first book of the Bible—Genesis—there are numerous references to dimensions. The Pyramids, dating back to 4700 B.C., and the Tower of Babel, were built by some definite system.

The Egyptians developed a clever method of measuring land. The Nile would overflow each spring, detroying most of the landmarks. Naturally, there were arguments as to where the boundaries had been. The farmers came up with a practical method of relocating their boundaries. Two sticks tied to the ends of a long rope were used to lay out a series of parallel and perpendicular straight lines. Beginning from fixed points above the flood level, two men would strike arcs in the mud and make geometrically accurate rectangles to outline each owner's field. That was so successful that the Greek Euclid refined the system into what we now call geometry.

The Babylonians developed a method of measuring weight. They suspended a single stick at its center with objects on each end and thus could compare by observing the balance. Later, instead of comparing the weight of two objects, they compared the weight of any one object with a set of stones or constant known "standard."

More than 1200 years after the time of Christ when the Roman Empire had become a matter of history, King Edward I of England took a tremendous step forward. Before this, men had usually used arms and legs and fingers to measure short distances—measurement standards varied with men's stature. King Edward ordered a permanent measuring stick made of iron to serve as a master standard yardstick. It was called the "iron ulna." It was standardized as the length of a yard and comes mighty close to its present-day length. King Edward realized that constancy and permanence were the key to any standard, and he had the iron ulna made of the strongest material of the day.

Later, in 1672 Sir Isaac Newton gave the world some new ideas on the nature of light and color. He discovered that when two very flat pieces of glass were pressed together, he could see circular bands of rainbow-like colors. These were called Newton's Rings and he had within his grasp an almost precise method of measurement but didn't recognize it. Later, other scientists built on Newton's groundwork and established a new branch of science called "Interferometry" which enables men today to measure within millionths of an inch.

About the time Napoleon was beginning to rise to power, in 1793, the French government adopted an entirely new system of standards based on what they called the "meter." The meter was supposed to be one ten-millionth part of the distance from the North Pole to the Equator when measured on a straight line running along the surface of the earth through, naturally, Paris. Of course, those men thought that in the physical world they had an unchangeable standard to which they could always refer. Later we found that wasn't so. Mother Nature has a habit of shrugging her shoulders once in a while.

Today, most civilized industrial nations relate their standards back to light waves which seem, up to the present, to be the least changeable of any standard we have discovered.

The transition of measurement from an art into a science was accomplished at the opportune time. The age of industrial progress was about to open and remake the world.

But if it weren't for accurate measurement and standards there could not be an Industrial Age, or machines, or mass production.

Before the Industrial Age, articles were handmade by skilled craftsmen. They fit and tried and made individual pieces and assemblies without the help of careful measurements, and so costs were high and markets limited. And once machines became generally used, many little factories, mills, and workshops came into being and each soon found, to maintain uniform quality, they had to have measuring standards of their own. Each company accordingly made its own measuring sticks based on its own idea of the length of the master standard yard. Often these were round dowels of wood tipped on each end with steel like the head of an arrow. They were called gages, and were much more convenient than a graduated ruler for unskilled workers to use. For the first time shoes could be mass produced rather than fit individually to each person. For the first time everyone became a candidate for shoes.

Later we find James Watt, building his first successful steam engine, mentioning that Wilkinson's boring mill could bore his cylinder round enough and just the right size so "a well-worn shilling would barely slip between the piston and the cylinder wall at any point."

That probably was the world's first feeler gage.

It remained for Eli Whitney to take the next great step—the principle of mass production of guns, made possible only by accurate measurements and interchangeability standards. While remembered as the inventor of the cotton gin, Whitney's first utilization of interchangeability in metal will be credited by historians as being much more significant. The key to his success was establishing his own definite shop standards and building the required patterns, jigs, and gages. Up to that time in the metal plants, even with machine tools, each craftsman usually used his own methods of measurement. Seldom, if ever, were any two parts identical. Obviously, the problem between different plants was even more variable.

After Whitney, an essential ele-

Inspectors using Johansson ("Jo") gage blocks in checking crankshafts. Developed in Sweden, these blocks were first widely used by Ford in large-scale development of automotive assembly line.

Ford Photographic Section

ment was still missing—a convenient means of providing identical precise standards of measurement and their duplication and conversion in a wide variety of plants manufacturing all kinds of products and parts.

Again, just at the right time a new development occurred — the now familiar slip gages or "Jo" blocks, together with their companion, the gage comparator. They enabled the establishment, maintenance, and transfer of convenient identical standards of measurement in an infinite range of sizes throughout the industrial world.

"Jo" blocks were developed in Sweden in the 1890's, but Henry Ford probably first recognized and made widespread use of their economic possibilities in his large-scale development of the first automotive assembly line. Similarly, he was among the first to foresee the advantages in widespread use of gage comparators in production as well as in final inspection to establish standards right at the machine. The gage comparator, together with slip gages, brought into any plant desiring them, are an inexpensive means of transferring and comparing an infinite range and combination of measurement standards and sizes accurate, if necessary, to millionths of an inch. Incidentally, everyone should always work to the broadest tolerances that give desired results, but some kind of tolerance should be specified.

The comparator was the first means of conveniently visualizing, interpreting, duplicating, multiplying, and applying these identical basic standards or slip gages, and thus made a practical reality out of what was previously only the highly desirable theory of volume interchangeability.

The importance of this standardization or interchangeability to our progress was well highlighted by "Boss" Kettering. He said, "The only thing that makes the assembly line possible is our ability to make pieces so exactly alike that we can take any one of a thousand and drop it into place and have it fit . . . I can remember the time when a thousandth of an inch was a very small thing—now you are talking of millionths of an inch. . . . Why are you constantly working to closer limits of tolerance? Only so that the product made on machine tools shall last longer, work better, and give you complete interchangeability of parts."

This development assured that hour after hour and day after day in countless jobs and in innumerable manufacturing operations in different areas men could be sure of using identical measurements.

Freely and gratefully acknowledging the contributions of science and engineering to progress, I must respectfully acknowledge the underlying importance of standardization and measurement in all fields. Thus, in the present developing state of this great new potential aircraft field, there is a wonderful opportunity to build on all the experience and advantages of industry's past standardization, avoiding the unworthy or irrelevant, selecting and using only the best. The aircraft industry and the Air Force made a natural and wise decision in hitching aircraft to the star of standardization.

We know the trend is toward higher speeds for military and commercial needs. What does this mean in plane design and power plant engines? Will there be revolutionary new ideas, refinements of old ones, new materials and fuels, new forms of energy? In these fields, civilian progress will closely follow military requirements.

We know that in our research departments it is desirable to stick our heads into the wild blue yonder, but simultaneously in manufacturing it is important that we keep our mental faculties on firm foundations. There must always be reasonable and wise compromise between those who want better and those who want more.

Consider the staggering job right here at Wright-Patterson Air Force Base of purchasing and testing the ever-changing new types of aircraft armament, missiles, and the myriad of allied materiel that add up to airpower. What a challenge to engineers and technicians and production specialists! Old standards must be refined; new standards must be established, maintained, and eventually revised. This is not a job for governments alone. Properly, it can only be accomplished by individuals and private companies working with our own and the governments of our participating allies. But with the cooperation of government, scientists, and industry, working through our clearing house, the American Standards Association, progress will continue to accelerate.

In the field of standardization, that is the challenge—that is our opportunity.

Industrial Launderers Join ASA

The most recent association to join the American Standards Association as an Associate Member is the Institute of Industrial Launderers. The Institute's membership consists of some 100 commercial laundries which specialize in cleaning, and supplying on a rental basis, all types of industrial work garments and shop towels for industry. Many specialized cleaning and renovating services are also provided for safety apparel used by industrial customers. The members and the services they provide extend through all of the 48 states, Canada, and the territory of Hawaii.

During the past several years the Institute's interest in standards has increased as the result of the work of its Research and Development Committee. This committee has under way a number of studies of laundering processes and of the performance of supplies purchased by the Institute's members. It also is studying the performance of fabrics handled through members' laundering plants.

Projects under the procedure of the American Standards Association that are of specific interest to the Institute include the Safety Code for Laundry Equipment and Operations and the proposed project on Performance Standards for Fabrics Used by Institutions.

Wise Purchasing—Key to Profits

A NEW economic climate is developing in this country in which profits will depend as much on wise purchasing and on savings in materials and production as on sales. This was what speakers told members of the National Association of Purchasing Agents at their annual convention at Los Angeles, May 25. In this new, highly competitive economy, standard specifications and methods of test will be more important than ever before. They will make it possible to buy standard materials and items best suited for the job and to check performance and quality with reproducible results.

Three speakers stressed the importance to industry of techniques that help cut costs and prevent waste.

Roger E. Gay, president of The Bristol Brass Corporation, and president of the American Standards Association, pointed out that many economists and management men are worried about the high break-even point on which industry is operating. With a thin profit ratio, a moderate increase in costs or a small drop in sales could mean a considerable drop in profits, he said.

In the new competitive market that is developing as a result of this condition, the manufacturer who cannot make his company pay with added efficiency is likely to go to the wall.

"Standards in purchasing, distribution, and production can help maintain the profit ratio," he declared. "No nation can get the most efficient results out of its human and material resources unless it has a complete, comprehensive set of national standards to work with, carefully integrated into all segments of the economy, unanimously adopted, and voluntarily followed.

"Such standards would simplify and speed production. They would help the sub-contractor to understand the prime contractor, and the prime contractor to understand the language of the thousands of his suppliers. Most important, at this particular moment, they would help to lower unit production costs."

On this same theme, the question "Can it be that increased sales are not the sure route to greater profits?" was asked by John A. Hill, president of Air Reduction Company, Inc. Mr Hill pointed out that in 1952 sales of American manufacturers increased by about 5 percent while profits both before and after taxes dropped off 7 to 15 percent.

In our present economy, wise spending is just as vital to good profits as intelligent and aggressive selling, Mr Hill said. For example, if a hypothetical 50 million dollar company saved 1 million dollars per year on purchases, it would be the equivalent of a 10 million dollar increase in sales.

"The big savings in purchasing today are made not through price chiseling but through careful analysis of values," he declared. "Intelligent purchasing is, first of all, a matter of deciding precisely what you need and not paying for anything you don't need."

H. W. Christensen of San Francisco, president of the National Association of Purchasing Agents, declared that "We are seeing the beginning of the end of that 'get it at any price' policy." Mr Christensen is director of purchases for U.S. Steel's Columbia-Geneva Steel Division.

He said that purchasing agents soon must "face up to the sterner regime of a free and highly competitive economy." Never has the purchasing function been more important to the economic well-being of a corporation. The way in which purchasing has been practiced in many industries during the past decade "cannot and will not be tolerated" in a free competitive market.

Both salesmen and purchasing agents have to relearn their techniques, Mr Christensen commented. "Salesmen are going to have to sell again. They are going to have to go back to work. If the salesmen must learn again to sell, then it is just as certain that the buyer must learn again to buy."

WHAT IS YOUR QUESTION?

Is there a standard on the spacing of T-Bolt Slots in Tables of Milling and Boring Machines?

The American Standard on T-Slots—Their Bolts, Nuts, Tongues and Cutters, B5.1-1945, includes tables on reversible tongues and tongue seats for T-bolts. These tables give diameters of T-bolts, tongue dimensions, depth of seat, total thicknesses, and height of shoulder, other tables give thicknesses of T-slots, thicknesses of T-bolts, thicknesses of T-knots, thicknesses of T-slot cutters and inserts.

Where can we find a test for coated abrasives?

Coated abrasives are used in so many different fields and for so many different purposes that manufacturers of this country have been forced to conclude that no one single mechanical test will ever be of any real value as a means of measuring performance.

Over the years, individual members of the Coated Abrasives Association have done a good deal of work towards developing performance tests, but none of this work has reached the point where results have become common property. In fact, the Association tells us, much of the work has never been put in report form by the individual companies.

I understand that you have information on standards and methods of test for ceramic dielectrics.

Although there are no American Standards specifically on ceramic die-

(Continued on page 215)

DANGER FROM THE SKY

by John A. Dickinson

Reprinted from National Safety News, May 1953

THE approach of the summer season brings with it the hazard of lightning for most of the area of continental United States. It is true that thunderstorms are very infrequent on the Pacific Coast, while certain Southern areas may have severe thunderstorms at any time of the year. Yet, in most parts of the country, lightning may well be regarded as a warm weather hazard.

Since the time of Benjamin Franklin (1750) lightning has been recognized as being a gigantic spark occurring between an accumulation of electric charge in a cloud and the earth, or another charged cloud. The most common source of such charged cloud centers is the thunderstorm, of which there are two main classes: (a) local convectional thunderstorms and (b) frontal storms. The former are the result of local heating of the air adjacent to the ground in summer, whereas the latter are the result of the overrunning of warm, moist air by a mass of colder air, giving rise to turbulence as a result of relative motion of the air masses.

In either case, there results an unstable condition that causes the warm, moist air to rise at an accelerating rate and by the condensation of its moisture to from a tall cumulo-nimb cloud. In such a thunderstorm cell, there is at first a violent up draft, followed later by strong down drafts. The little understood processes that lead to the separation of large amounts of positive and negative electricity are doubtless related to these vigorous air movements.

The usual thunderstorm involves several such circulation "cells," and in the case of a frontal storm, these may extend in a row for many miles. Usually negative electric charges accumulate in the lower portions of the cloud, whereas positive charges are carried to the upper portions, with the result that enormous differences of electric potential are developed between the top and bottom of cloud and between clouds and earth.

John A. Dickinson is Head, Safety Codes Group, National Bureau of Standards, U. S. Department of Commerce, Washinton, D. C. He is secretary of Sectional Committee C5 on Code for Protection against Lightning.

Lightning protection consists of providing a preferred path (lower resistance or more properly, lower impedance) to ground on the outer surface of, or at a short distance from, the structure to be protected. Mechanical damage and heating to incandescence result when there is no such path available and the discharge is through materials of high electrical resistance, such as wood, stone, or brick.

Many people believe that the lightning protective system protects the building by discharging the earth current from the sharp points of the rods so that the potential from the ground to cloud becomes less than that of the surrounding areas and hence, prevents a stroke. There may be some slight effect of this kind with very tall structures but generally speaking, the current discharge from the points is too feeble to affect materially the rapid rate of accumulation of electric charge occurring in the thundercloud.

If the earth-current discharge theory were sound, a mountain covered with evergreens should never be struck since there are unnumbered millions of sharp points to discharge this current, yet a very considerable percentage of forest fires are started by lightning.

Deaths from lightning range from 375 to 500 annually, most of them occurring out-of-doors. Certain sports seem to have an unduly large number of deaths from lightning. In the case of golf the death rate has been so high that the U.S. Golf Association has made a study of this hazard and issues an annual warning to its members and has gone into the study of design of emergency shelters that would afford protection against lightning as well as rain.

Boats, particularly sailboats, are struck fairly frequently, sometimes with fatal results to the crew. Automobiles are seldom struck and, if they are, the charge will jump the few inches between the wheel rims and the ground. The occupants, being shielded by the sheet-metal body of the car, will be uninjured.

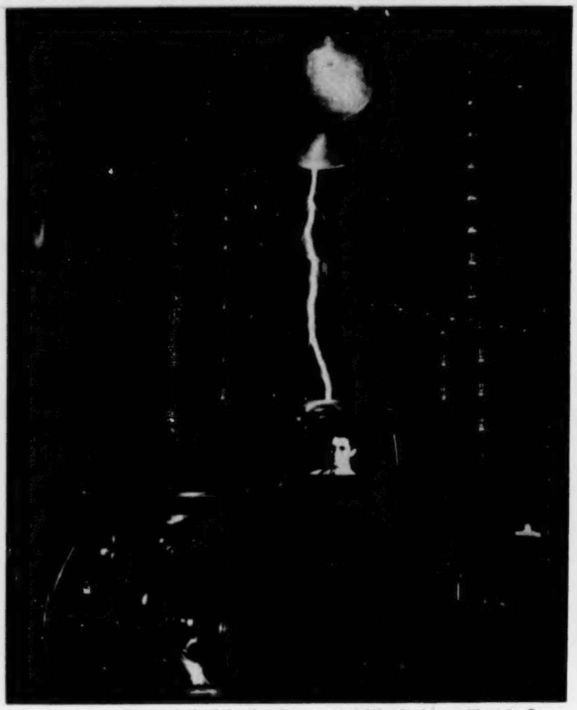
Swimmers are sometimes badly shocked and occasionally killed when lightning strikes the water in which they are swimming. The best rule is to get out of the water when a thunderstorm is approaching.

When you are in a relatively flat, open area, such as the average golf course, you are higher than the surrounding terrain and, as such, are a target for a stroke. Similarly, the mast of a sailboat is a projection above the water level plane and consequently is more liable to be struck.

The American Standard Code for

The multiple discharge nature of a lightning stroke is strikingly demonstrated in this photograph. This was not taken with a revolving camera; the effect is due to the changing position of the path of ionized air under the influence of wind and the buoyancy of heated gases.

Courtesy the Weather Bureau and Mr. Gaty



Courtesy the Weather Bureau and Westinghouse Electric Corp

Even if car is struck, passengers are safe. A dramatic test is made in the lightning laboratory of Westinghouse.

Courtesy the Weather Bureau

Dynamite couldn't have done a more thorough job. Here is evidence of the potential power of a lightning stroke.

Protection Against Lightning,[1] recently revised, gives the following simple rules for protection of persons:

101. Personal Conduct.

(a) Do not go out of doors or remain out during thunderstorms unless it is necessary. Stay inside a building where it is dry, preferably away from fireplaces, stoves, and other metal objects.

(b) If there is any choice of shelter, choose in the following order:
1. Large metal or metal-frame buildings.
2. Dwellings or other buildings which are protected against lightning.
3. Large, unprotected buildings.
4. Small, unprotected buildings.

(c) If remaining out of doors is unavoidable, keep away from—
1. Small sheds and shelters if in an exposed location.
2. Isolated trees.
3. Wire fences.
4. Hilltops and wide open spaces.

(d) Seek shelter in a cave, a depression in the ground, a deep valley or canyon, the foot of a steep or overhanging cliff, dense woods, or a grove of trees.

The question of the effectiveness of lightning rods is frequently brought up. The farm buildings of Iowa form a rather interesting testing ground. Approximately one-half are protected and the balance are unrodded. The losses over the period 1930 to 1949 show a fire loss of only $380,841 for the rodded buildings but $2,539,009 for the unrodded structures. These results indicate that rodding is a very real protection.

The question is frequently asked, "If lightning rods have proved desirable in farm areas, why aren't they equally desirable in the city?" The answer lies in the fact that a group of farm buildings are generally the only buildings for a considerable distance; frequently they are in the center of an 80- or 160-acre tract with fields or pastures around them and generally are the highest objects in that area. In the case of houses in the city, they are closely packed, reasonably uniform in height and in most cities there are several houses to the acre; if we assume that there are three, then there would be roughly 2,000 structures to the square mile, whereas in farm areas the number might be from 12 to 20 in a corresponding area. Since the chance is good that a relatively high object will be struck, we have a ratio of about 200-to-1 that a farm house will be hit in a given period of time as compared to a house of the same size and height in the city. Consequently, most people feel that the percentage chance of their city home being struck is so low that the cost of protection is not warranted.

If your house is located on a high point even though you live in a city, protection may be desirable because of the greater probability of its being struck.

A very tall object in a city, such as a church steeple or tall monument, will almost invariably be struck and should be protected. The Washington Monument is struck several times a year, yet is it so well protected that persons within the Monument may not realize that it has been hit. The Empire State Building in New York is struck on an average of 30 or more times per year, yet, tenants are quite unaware of the fact unless they realize that the flash and very loud crash are simultaneous. The General Electric Company has conducted lightning studies on this building and the story has been published under the title of *Playing with Lightning* by K. B. McEachron and T. J. Hagenguth (Random House, 1940). This is a most interesting

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[1] American Standard Code for Protection Against Lightning has been published as NBS Handbook 46; NFPA 78, in one volume: Part I, Protection of Persons, C5.1-1953; Part II, Protection of Buildings and Miscellaneous Property, C5.2-1953; Part III, Structures Containing Flammable Liquids and Gases, C5.3-1953, $0.40.

story; written for the average layman, it gives an excellent background on present knowledge of lightning.

Basically, the idea of building protection is simple. All high points such as chimneys, roof peaks, and the like, are protected with collector points connected to heavy connectors which in turn are connected to adequate grounds. The sizes of conductors and down runs (which connect the network with the actual grounding means) are given in the *Code for Protection Against Lightning*. Grounds should always be in multiple since, if dependence is placed on a single ground and the continuity of the connection is broken accidentally, the structure may be damaged by the stroke trying to get to ground. For the same reason, metallic masses, such as plumbing or heating systems inside the structure, which are located within six feet of a down conductor, are generally tied into the lightning system to avoid side flashes to such grounded metallic masses. The multiple ground system also furnishes a more direct path to ground for a flash striking at the side of a building.

The grounding is generally accomplished by clamping each down conductor to a pipe or rod which has been driven deep enough to reach a layer of permanently moist ground. In most locations, this will be at a depth of six to eight feet. Where the soil is very dry, or where there is rock within two or three feet of the surface, a ground loop of heavy stranded copper or galvanized wire is placed in a trench 15 to 18 inches deep and all down conductors attached to it.

Such loops are frequently used as part of the protective system for old and valuable trees. All of the old trees at Mt. Vernon (some of them planted by George Washington) are so protected. In such cases, the down conductors are led radially outward in shallow trenches to the loop, which is of great enough diameter to be outside of the root area. If rods were driven close to the trunk, the current from a stroke might seriously damage the roots.

A tall, grounded metallic object will give almost perfect protection to any object located within a 45-degree angle of its top, and any object within a cone making a 30-degree angle with the ground receives considerable protection. By using a series of grounded vertical steel poles, very good protection may be secured for structures within a cone making a 45-degree angle with the ground. If the tops of such poles are connected with heavy-stranded cable the volume protected becomes "tent shaped."

Such systems are widely used in industry, particularly for explosives loading units and similar plants where it is desired to keep the discharge well away from the structure but are seldom used for residences because of their more or less ungainly appearance. However, ornamental bronze flag poles could be designed and located so as to afford protection to moderate size public buildings.

Steel cables stretched between steel towers or poles are frequently used to protect high voltage electrical equipment, in fact, almost all very high voltage transmission lines have one or more grounded conductors located above the phase wires (which are generally carried on suspension insulators) to protect the system against a stroke. The same system is sometimes used for oil tanks or other structures.

Wire fences, particularly when mounted on wood posts, may carry a lightning stroke a long distance and frequently kill cattle grazing along such a fence line. Wire fencing should be grounded at intervals of about 150 feet to prevent the transmission of this hazard to persons or animals at a distance from the point originally struck.

With present engineering knowledge, almost any structure can be made reasonably safe from lightning damage. Steel-frame buildings are inherently protected if the foundations are reasonably deep, but occasionally damage is done to brick, stone, or terra cotta copings when lightning makes its way through such material to the steel frame beneath it. This can be taken care of by a flat strip or small angle of metal placed along the outer edge of the masonry and connected at intervals to the building steel.

The basic principles of lightning protection should be understood by every safety engineer since it is both an occupational and an off-the-job hazard.

Earthquake? No, just a playful lightning bolt.

Courtesy the Weather Bureau

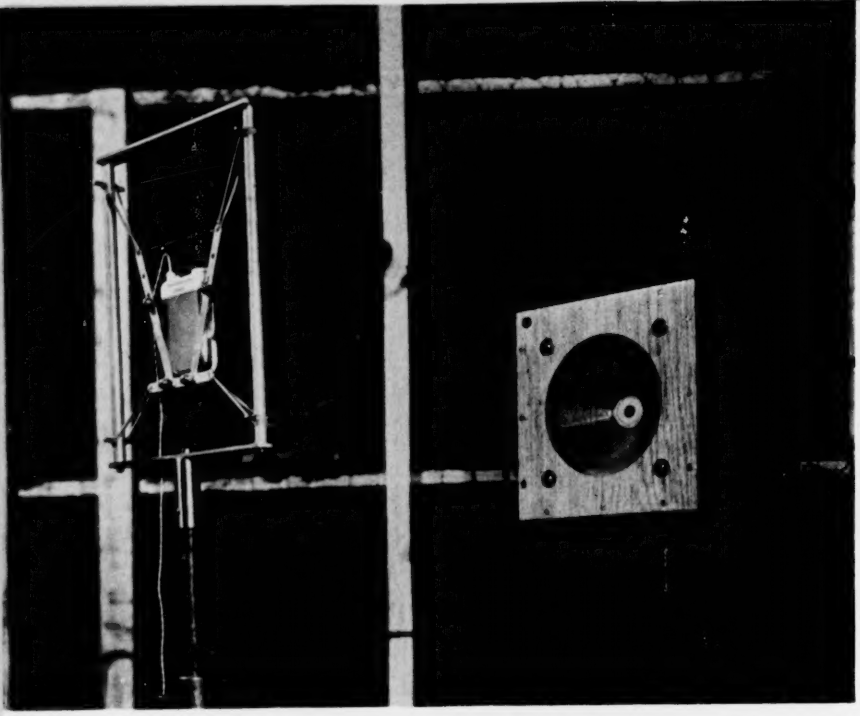


Fig. 1—Hearing aid (left) is set up in small sound-proof room and carefully mounted to prevent mechanically transmitted vibration during test. Sound for test is controlled through loud speaker at right.

A Forward Step for Testing Hearing Aids

by S. F. Lybarger

A HEARING aid has always been a most difficult acoustic device on which to make measurements. Back in the "carbon" hearing aid days, we had to contend with the variable performance of sensitive carbon microphones and amplifiers. It was quite a task to run a frequency response curve without having the hearing aid's sensitivity jump to some new value during the test. With the advent of wearable vacuum-tube hearing aids, hearing-aid stability was greatly improved and measurements were easier to make from the standpoint of stability.

A modern hearing aid consists of a crystal, ceramic, or magnetic microphone operating into a vacuum-tube (or transistor-) amplifier that delivers its amplified electrical output to a miniature air or bone-conduction hearing-aid earphone. Despite the relative simplicity of this setup, the problem of making satisfactory performance measurements is not a simple one. Because hearing aids are so tiny and because limited battery power may be used, they must be operated pretty much to the fullest extent of their capabilities; nothing can be wasted—either in space or in battery power. As a result, the frequency response, for example, may be subjected to the input sound-pressure level employed, to the volume control setting, to the battery voltages employed, and to other factors that are not a problem on large-size amplifiers. A very serious problem in hearing-aid measurements is noise in the test room. When it is realized that some modern hearing aids have as much as 80 decibels of acoustic amplification, the problem of choosing suitable test conditions in a typical sound room can be appreciated.

The new American Standard should be especially useful to all those interested in hearing-aid measurement. It permits, for the first time, making measurements that are truly *reproducible* from one laboratory to another. Frequency-response curves or distortion curves of the same hearing aid, made in different laboratories, should check within the experimental error normally to be expected, probably a couple of decibels.

Reproducibility of results has been achieved by making full use of the earlier American Standards for Laboratory Standard Microphones (Z24.4-1949, Z24.8-1949) and for the Coupler Calibration of Earphones (Z24.9-1949) as well as by making very specific both the *conditions* for the hearing-aid measurements, and the *procedures* for making the tests.

For the acoustic measurements in this test, it was decided to place the hearing aid in a so-called "free field," in other words, in a free space where an essentially plane sound wave could be applied. Careful consideration was given both to the idea of the closed-cavity sound source and also to the idea of using a baffle in back of the hearing aid to simulate the effect of the human body. It was felt, however, that these would present serious problems as far as the reproducibility of results is concerned. The air-conduction receiver of the hearing aid is placed on a type-2 coupler for insert earphones (see American Standard Method for the Coupler Calibration of Earphones, Z24.9-1949). A photograph of a simple setup of the various components in the test of a hearing aid is shown in Figure 1. Figure 2 shows some of the associated equipment employed in testing the response and distortion characteristics in one laboratory. The equipment shown is for "point-by-point" measurement, but the standard is completely adaptable

Mr Lybarger is Chief Engineer of E. A. Myers and Sons, Inc, Pittsburgh, designers and manufacturers of Radioear Hearing Aids. He was chairman of the Writing Group on Hearing Aid Test Code, Z24 W10, charged with the responsibility for preparing this new standard. The Writing Group was a subcommittee of the Sectional Committee on Acoustical Measurements and Terminology, Z24, sponsored by the Acoustical Society of America.

The new American Standard Method for Measurement of Characteristics of Hearing Aids, just released, is another forward step in the difficult standardization of hearing-aid measurements. This new American Standard succeeds a hearing-aid test code worked out by a technical committee of the American Hearing Aid Association in 1944.

to automatic measuring methods.

It would be convenient if some one or two acoustic measurements were sufficient to tell what a hearing aid would do for a particular individual with a known hearing loss. The group writing this standard has attempted to reduce the number of tests required to define hearing-aid performance to a minimum, but a number of tests are still needed.

First, of course, is the need to know the frequency response under typical conditions of use. Then we need to know what happens to the frequency response for different input sound-pressure levels, and to what extent volume compression occurs, if at all. In the new American Standard Method for Measurement of Characteristics of Hearing Aids, Z24.14-1953, it was found possible to give all the above information for a particular volume-control setting on a single graph by providing for a family of output curves with the input sound-pressure level as the parameter. Such a graph, for a particular hearing aid, is shown in Figure 3.

The "basic frequency response" is shown as the response when an input sound-pressure level of 50 decibels (re 0.0002 dyne per square centimeter) is used. The hearing-aid volume-control is set to give an output of 100 decibels, corresponding to a gain at 1000 cycles per second, for the selected input level of 50 decibels. The input sound-pressure level chosen for this basic frequency-response curve corresponds fairly well to the intensities produced by weak speech when the speaker is at a moderate distance from the hearing-aid user.

The volume-control setting of the hearing aid selected was also based on typical user conditions, although it is obvious that a considerable range of settings will be found in actual use, depending on the hearing loss of the user.

From the measurement standpoint, the selected test conditions for the basic frequency response are perhaps as good a choice as can be made. For most test locations, the 50-decibel input level is about the lowest that will permit a complete response curve to be run without interference from noise. It also is about the highest input level that can be used without encountering an appreciable amount of

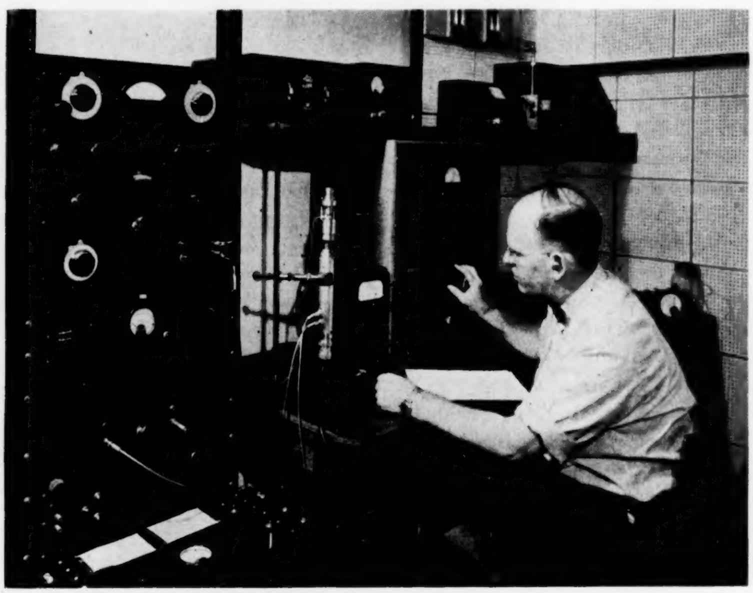


Fig. 2—In measuring response of hearing aid during tests, earphone coupler, as described in American Standard Z24.9-1949, is used in conjunction with test equipment (Fig. 1) and measuring instruments. Equipment shown here measures response to different sound levels and distortion of sound by hearing aid.

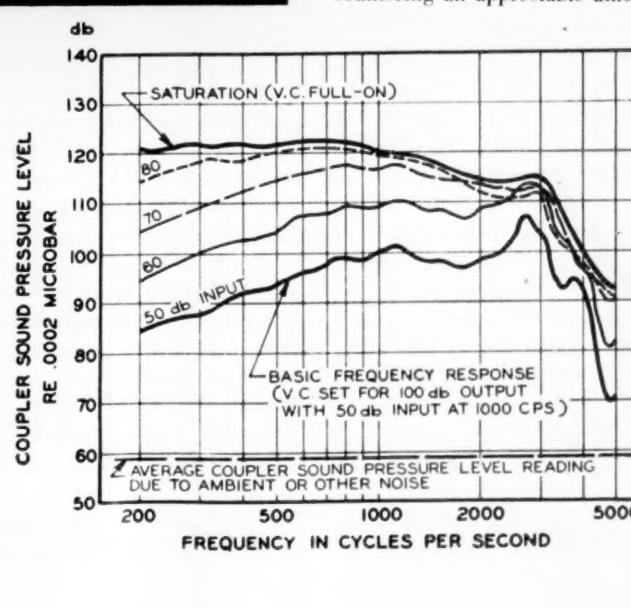
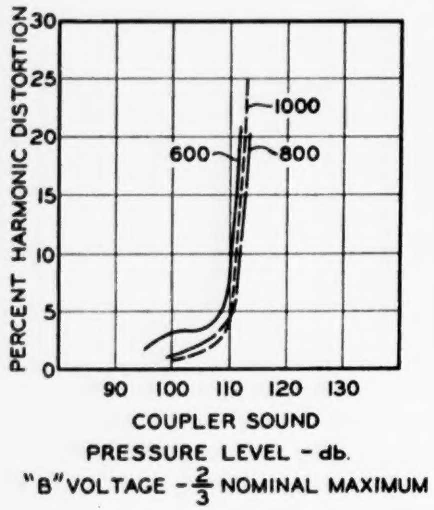


Fig. 3—As explained in text above, this typical graph, made in accordance with American Standard Z24.14-1953, shows the basic frequency response curve, comprehensive frequency response curves, and the saturation output curve for a particular hearing aid. Tone control settings, battery voltages, and temperature should also be specified. (V. C.—Volume Control; db—decibels; cps—cycles per second.)



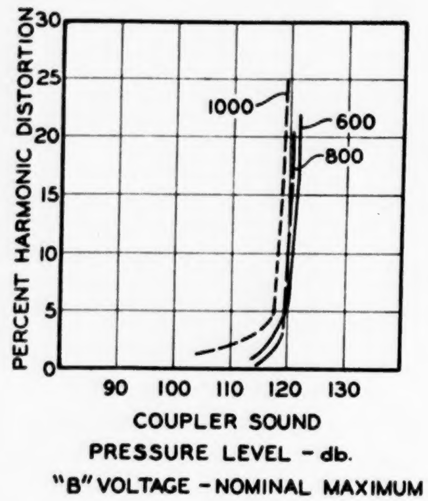


Fig. 4—Plots of harmonic distortion vs output sound pressure for a particular hearing aid at the three specified test frequencies and for two specified battery voltage conditions.

overloading at the higher frequencies on many vacuum-tube hearing aids.

In addition to the frequency response of the hearing aid at the 50-decibel input level, much can be learned from additional frequency-response curves made with other input levels, either higher or lower. Figure 3 shows additional response curves made with input levels of 60, 70, and 80 decibels, although any other convenient levels and steps may be chosen. From the entire family of curves, which have been termed the "comprehensive frequency response," and which are made with the volume control at the reduced setting previously mentioned, a number of things can be determined. In the first place, in the event that noise in a test location prevents accurate measurement of the hearing-aid output at the lower input levels, the shape of the response curve in the frequency regions where the amplification of the hearing aid is low is clearly shown by the curves made at higher input levels. Another thing that immediately becomes apparent is whether or not the input-output characteristics of the hearing aid are linear. When they are linear, the output curves will be separated by the same number of decibels as the difference between the chosen input levels. One can also easily see from these curves at what frequencies the amplification of the hearing aid is compressed or whether compression is present. Obviously, there are certain conditions under which actual input-output curves may be desirable, particularly in hearing aids having automatic volume control. Such curves are suggested in the standard when needed.

Another characteristic of the hearing aid that is measured is the maximum gain. This is defined in the standard as the gain with the volume control set at maximum, and with an input sound-pressure level of 50 db.

This curve indicates, first, how much potential gain the hearing aid has with the volume control full-on and, second, it indicates whether there is an appreciable change in the *shape* of the response curve as compared to shape of the basic frequency-response curve. There may be some overloading in the high frequencies on some hearing aids when this test is made and, therefore, the indicated maximum gain may be somewhat less at some frequencies than would be obtained if lower input levels were employed. The maximum gain is important because it tells whether the hearing aid has enough amplification to take care of a given hearing loss with the necessary reserve to compensate for loss in battery voltage during the normal life of the battery.

In addition to knowing the response of the hearing aid under various conditions, it is also highly desirable to know just how much sound pressure the hearing aid is capable of delivering with input sound-pressure levels high enough to give the maximum possible output sound pressure. For the first time, this standard includes a provision for measuring this so-called "saturation output." Actually, it is a plot of the maxima of a large number of input-output curves versus frequency but is very easily obtained without the necessity for making these curves. The saturation output is of particular interest in the selection of a hearing aid because it indicates whether the hearing aid might produce sound-pressure levels that could be considered uncomfortable or dangerous to the ear of a particular individual. Conversely, experience has also shown that the saturation output is closely related to the apparent power that the hearing aid will deliver. Thus it is a good indicator of whether the hearing aid will deliver enough output sound pressure to meet the requirements of a person having a given hearing loss.

Closely related to this saturation output and, of course, more important, are the distortion characteristics of the hearing aid. In the new standard, a specification has been provided for measuring the harmonic distortion of the hearing aid with an input sound-pressure level of 75 decibels, with the volume control of the hearing aid being varied to obtain a curve of percentage distortion versus

output sound-pressure level. Figure 4 shows distortion curves made on a particular hearing aid at the three standard test frequencies chosen for the distortion measurements. A "good" distortion characteristic would be one in which the distortion is very low at the lower ouput sound-pressure levels and stays fairly low right up to the output sound-pressure level at which the hearing aid saturates. Unless automatic volume control is employed, the distortion on most hearing aids rises rather rapidly as saturation is approached. Of course, operation of the hearing aid will normally be below this region.

It is known that intermodulation distortion and transient distortion may also be very important in determining hearing-aid performance, but they present some rather difficult standardization problems at this time (as applied to hearing aids).

In addition to the measurement of the various characteristics already described, the standard also provides for the measurement of the effects of tone-control changes on the basic frequency response, specific methods of measuring the effects of battery-voltage variations on the gain of the hearing aid, and also standardized methods of measuring "A" and "B" battery current.

Much work has been done and will be done on the question of correlating the physical characteristics of a hearing aid with the observed subjective performance of the hearing aid on a hard-of-hearing individual. Without some clearly defined standard on which to base the physical comparisons between various hearing aids it would be rather difficult to arrive at a really good correlation. It is felt that the present standard will permit a much better comparison of test data between various workers in the hearing-aid field and those in the psychoacoustic field who are primarily concerned with the subjective aspects of hearing-aid performance.

The present standard is limited specifically to the measurement of air-conduction vacuum-tube hearing aids. It has not yet been found possible to standardize measurements on bone-conduction receivers properly but it is hoped that this problem can some day soon be brought to a point where good standardization will be possible.

As this article is being written, the hearing-aid industry is in the process of "transistorizing" many hearing aids and it is entirely possible that most hearing aids will be either all-transistor or partly transistor within the next year. Fortunately, the air-conduction vacuum-tube standards are directly applicable to transistor-type hearing aids with some very minor changes. In an all-transistor hearing aid, for example, there is usually only one battery. Thus, a standard test voltage can be selected for this battery to make the same tests that are covered by the Z24.14 standard. Probably a voltage of 1.25 volts per cell of battery supply used will be found very appropriate. One problem that will be encountered with transistors is the necessity of holding the hearing aids at a more uniform temperature than is necessary with vacuum-tube hearing aids. Transistors themselves are subject to considerable variation in output with temperature, and to get good results in measurements the allowable temperature range should probably be held to within a total of 5 degrees. Probably a range of 85 to 90 F would be appropriate. Another factor that may become somewhat of a problem with transistorized hearing aids is internal noise. This will make measurement somewhat more difficult. It is possible that some consideration should be given to a standard method of evaluating this noise.

The new American Standard Method for Measurement of Characteristics of Hearing Aids, Z24.14-1953, can be obtained from the American Standards Association at 50 cents per copy. Other standards in this series, published recently, are:

American Standard Specification for an Octave-Band Filter Set for the Analysis of Noise and Other Sounds, Z24.10-1953 $0.50

American Standard Specification for Pure-Tone Audiometers for Screening Purposes, Z24.12-1952 $0.50

New Viscosity Standard Adopted

As of July 1, 1953, the National Bureau of Standards has adopted the value of 0.01002 poise for the absolute viscosity of water at 20C as the primary standard for the calibration of standard viscosity samples and viscometers.[1] The date originally proposed for this change was July 1, 1952. At the request of the American Society for Testing Materials and the International Organization for Standardization, the adoption of the new value for water was deferred for one year in order that ASTM and ISO members could make the change simultaneously with NBS. The ASTM, the National Physical Laboratory in England, and the Physikalisch-Technischen Bundesanstalt in Germany have indicated that they will also adopt the new value on July 1, 1953.

Up to the present time the value of 0.01005 poise for the absolute viscosity of water has been used widely as the primary reference standard. The use of the new value of 0.01002 will result in a reduction of 0.3 percent in the measured values of viscosity and will make viscosities reported in absolute units correspondingly more accurate. Previously published data based upon 0.01005 poise may be adjusted to the new standard by reducing the published values by 0.3 percent.

[1]In terms of kinematic viscosity this new value is equal to 1.0038 centistokes at 68 F.

What Is Your Question?

(*Continued from page 208*)

lectrics, a number of standards deal with various phases of this subject. These are:

Insulator Tests, C29.1-1944

Measurement of Test Voltage in Dielectric Tests, C68.1-1942

Apparatus Bushings and Test Code for Apparatus Bushings, C76.1-1943

WORK TO START ON INDUSTRIAL DIAMONDS

MORE effective use of industrial diamonds as a vital element in defense production is the objective of a new project to be started soon under the procedure of the American Standards Association.

A general conference of interested groups recommended the new standardization project. Tool engineers, the diamond trade, machine tool builders, industries using diamond tools, engineering societies, and the Armed Forces, were represented.

The new project aims at interchangeability of diamond tools and their holders. The conference defined a "diamond tool" as the combination of a diamond and the "nib" or "shank" directly carrying it. A "holder" was defined as the fixture holding the diamond tool in the machine with which it is used.

Such a large variety of diamond tools and holders have been developed over the years that there is no interchangeability between these parts, discussion at the conference disclosed. The new ASA project is expected to remedy this situation and eliminate the present necessity of stocking a large number of different replacement parts.

The scope of the work to be undertaken was tentatively defined to cover terminology and definitions applying to loose diamonds and diamond tools, and dimensions of diamond tools and tool holding accessories.

Industrial diamonds play an important part in mass production. Their conservation is essential if industry is to continue without disruptive delays, it was stated during the discussion. Industrial diamonds are used as cutting tools, for example, in turning and boring operations, and also in devices for truing and dressing abrasive wheels to restore their effective performance.

The American Society of Tool Engineers, which requested the ASA to consider the problem, offered to assume the administrative responsibility as sponsor for the project. The Industrial Diamond Association of America, trade association of the suppliers, agreed to join in this responsibility. The conference recommended that the two organizations be invited to accept joint sponsorship of the project and organize a technical committee to develop standards in this field.

The recommendations made by the Conference are now before the Mechanical Standards Board for approval.

Composite photograph of diamonds at work. 1, a diamond wheel grinding a carbide tool; 2, diamond tool used to finish bore piston pin holes; 3, 4 and 5, respectively, diamond dressing of an abrasive wheel and a single-point and cluster-type dressing tool. 6, shows an incandescent lamp whose filaments of fine wire, 7, are drawn through diamond dies, 8; 9 is a diamond core-bit, and 10, 11, 17 and 18, in that order, the drilling rig, the actual drilling cores or rock strata, core drilling operation for oil, and the derrick. Shown at 12 is a cylindrical part being turned with a diamond tool; and at 13, tools for shaping of plastics parts. 14 and 15 are removable diamond sawing lugs, and 16 shows stone sawing with a diamond saw.

Courtesy Industrial Diamond Assn of Amer, Inc

THAT SHRINKING PROFIT MARGIN

From a speech by Roger E. Gay, President, The Bristol Brass Corporation; President, the American Standards Association.

It is a well-recognized fact that the typical corporation must sell much more today to make as much as it did a dozen years ago. Some experts say twice as much. One thing certain is that there are far too many companies whose profit margin is so narrow that the slightest increase in their costs—or the least drop in their sales—would send them into the red.

I would like to recommend to the majority of American business the lesson that a large minority of American business has already learned. It is this: that one of the last major areas where production and distributions cost can be cut lies in the application of standards techniques.

USA Team at International Meetings

AN American team of 15 experts attended technical committee meetings of the International Electrotechnical Commission in Opatija, Yugoslavia, June 22 to July 5. R. C. Sogge, Manager, Standards Services Department of the General Electric Company and president of the U. S. National Committee, headed the delegation.

Four members of the delegation attended meetings of the IEC Committee of Action—Mr Sogge; P. H. Chase, Assistant to the President in charge of Engineering, Philadelphia Electric Company; and American Standards Association staff members Vice Admiral G. F. Hussey, Jr (Managing Director, ASA) and J. W. McNair who is also secretary of USNC.

Dr Harold S. Osborne, formerly chief engineer of the American Telephone and Telegraph Company, president of the IEC, presided at the meetings.

The United States was represented on 10 of the technical committees scheduled to meet—Graphical Symbols, Radio-Communication, Electrical Insulating Materials, Switchgear, Power Converters, Electric and Magnetic Magnitudes and Units, Letter Symbols, Electric Lamps, Lightning Arresters, and Electronic Tubes. U. S. representatives were also on several of the subcommittees.

The IEC is the international coordinating body in the field of electrotechnical standards. The National Committees of 26 countries comprise its membership. In 1947 it became affiliated with the International Organization for Standardization as the latter's electrical division. It maintains a close working relationship with other international bodies.

Formed in 1904 at the International Electrical Congress in St Louis, the IEC will celebrate its Golden Jubilee in this country, in Philadelphia in 1954.

U.S. NATIONAL COMMITTEE DELEGATES
IEC Meetings in Opatija, Yugoslavia
June 22 to July 5, 1953

L. J. Berberich, Manager, Liaison Engineering, Westinghouse Electric Corporation, East Pittsburgh, Pennsylvania

C. C. Chambers, Dean, Moore School of Electrical Engineering, University of Pennsylvania, Philadelphia, Pennsylvania

P. H. Chase, Assistant to the President in Charge of Engineering, Philadelphia Electric Company, Philadelphia, Pennsylvania; Vice-President, U. S. National Committee

Virgil M. Graham, Director of Technical Relations, Sylvania Electric Products, Inc, Bayside, New York; Chairman, Joint Electron Tube Engineering Council

M. H. Hobbs, Manager, Switchgear Engineering, Westinghouse Electric Corporation, East Pittsburgh, Pennsylvania

E. M. Hunter, Manager, Substation Division, Central Station Engineering Divisions, General Electric Company, Schenectady, New York

Vice Admiral G. F. Hussey, Jr, Managing Director, American Standards Association, Incorporated, New York, New York; Treasurer, U.S. National Committee

B. Lazich, Electrical Project Engineer, Union Switch & Signal Division of Westinghouse Air Brake Company, Swissvale, Pennsylvania

J. F. McClenahen, Manager, Standardizing and Testing Division, General Electric Company, Nela Park, Cleveland, Ohio

J. W. McNair, Electrical Engineer, American Standards Association, Incorporated, New York, New York; Secretary, U.S. National Committee

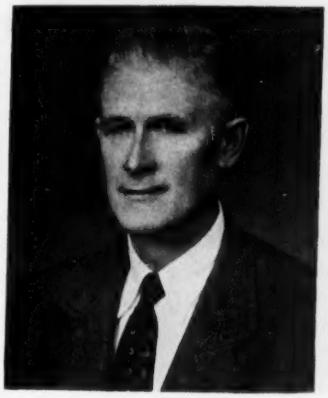
Leon Podolsky, Assistant to the President, Sprague Electric Corporation, North Adams, Massachusetts

August Schmidt, Jr, Application Engineer, Industrial Engineering Division, General Electric Company, Schenectady, New York

E. F. Seaman, Head Engineer, Standardization Planning Branch, Department of the Navy, Bureau of Ships, Washington 25, D.C.

R. C. Sogge, Manager, Standards Services Department, General Electric Company, Schenectady, New York; President, U.S. National Committee

H. P. Westman, Editor, Electrical Communications, International Telephone & Telegraph Company, New York, New York



William F. Brown

New Member of ASA Board

William F. Brown, Safety Director of the Consolidated Edison Company of New York, has been elected a member of the American Standards Association's Board of Directors. Mr Brown was nominated by the National Safety Council to complete the late G. B. Butterfield's unexpired term.

Mr Brown has been active in accident and fire prevention work for more than 30 years. He has served as technical consultant on the President's Industrial Safety Conference, is first Vice-President of the American Society of Safety Engineers, a member of the Board of Directors and chairman of the Operating Committee of the Greater New York Safety Council, and a member of the National Safety Council's President's Medal Administration Committee. He has been a member of the Safety Code Correlating Committee of the American Standards Association since August 14, 1950.

"The English yard was established by Edward I in 1305, to fit in with Saxon land measure of $5^1/_2$ yards to the Saxon land rod, which in turn measured 15 Saxon feet of 13.2 in. By this measure, all the land of England had been recorded in the Domesday Book of William I (1085)."
—*Fifty Years of British Standards.*

Standards From Other Countries

Members of the American Standards Association may borrow from the ASA Library copies of any of the following standards recently received from other countries. Orders may also be sent to the country of origin through the ASA office. The titles of the standards are given here in English, but the documents themselves are in the language of the country from which they were received. For the convenience of our readers, the standards are listed under their general UDC classifications.

547 Organic Chemistry

Poland — ***PN***
Wood rosins — C-97501

United Kingdom — ***BS***
Ethyl methyl ketone (methyl ethyl ketone) — 1940:1953
Isobutyl methyl ketone (methyl isobutyl ketone) — 1941:1953

614.8 Prevention of Accidents. Safety Measures

Australia — ***A.S.***
Australian standard specification for industrial leather gloves and mittens — Z.4-1952

France — ***NF***
Semi-rigid and flexible hoses — S 61-111
Symmetrical couplings for flexible hoses. Conditions for interchangeability — S 61-701
4 standards for fire hose nozzles and parts — S 61-821,2,3,5

Germany — ***DIN***
Fireman's hooks — 14851, 14852
Sectional ladder — 14711

Israel — ***SI***
Fire extinguishers, portable, soda-acid type — 74

Netherlands — ***(Temporary) V***
Safety colors — 3011

Poland — ***PN***
First-aid kit for kindergarten children — Z-86108
First-aid kit for schools — Z-86114
2 standards for two types of first-aid kits — Z-86005,-86105

United Kingdom — ***BS***
Fireguards for heating appliances — 1945:1953
Green protective spectacles and screens for steelworks operatives — 1729:1952
Industrial overalls for men and women — 1907:1952

620.1 Testing Materials. Faults in Materials

Germany — ***DIN***
Standard methods of testing materials, general — 50119
Testing of rust- and corrosion-preventing chemicals for iron and steel — 50940

United Kingdom — ***BS***
Performance tests for protective schemes—used in the protection of light-gage steel and wrought iron against corrosion — 1391:1952

621 Mechanical Engineering

France — ***NF***
9 standards for different types and sizes of covers for inspection doors — F 20-017 thru -024, -035
Steam turbines. Specifications — C 55-100

Germany — ***DIN***
Hydraulic pressure pumps — 2770
Spring leaf clamps — 4621

Spain — ***UNE***
Steam boilers. Standard pressures and temperatures — 9001
Calculation of crown bars — 25046
Washout doors — 25047

Sweden — ***SIS***
Coil springs, compression and tension types — SMS-888

621.64 Devices for Conveyance and Storage of Gases and Liquids in General

Germany — ***DIN***
Welded steel pipes. Delivery specifications — 1626
Steel pipes, heavy, screwing — 2441
Welded steel pipes from 10 to 2420 mm diameter. General table — 2458

Spain — ***UNE***
General table of different types of pipes — 19010
Flanged cast-iron pipes for nominal pressure 10 — 19020
Steel pipes, heavy, threaded — 19041
Flanges for nominal pressure 10 and 16 — 19153

United Kingdom — ***BS***
Domed ends for tanks and pressure vessels — 1966:1953
Pressure-operated relay valves for use with town gas — 1963:1953
Tools for soldered socket-spigot joints for lead and lead alloy pipes — 1958:1953
Seamless steel butt-welding pipe fittings — 1965:1953

621.74 Foundry Work

Czechoslovakia — ***CSN***
20 standards for methods and tools for polishing foundry molds — 1464-1483

Sweden — ***SIS***
Molding boxes — SMS-932

621.79 Various Workshops and Processes for Treatment of Metals

Germany — ***DIN***
Motor for bucket conveyor — 24030
Different types of bin-and hopper-gates — 24021/2/3/4

Hungary — ***MNOSZ***
9 standards for welding practice — 4300/4306, 4309/4310

United Kingdom — ***BS***
Metal containers (Packaging code) — 1133:Section 10:1953
Adhesives for packaging (Packaging code) — 1133:Section 16:1953

631 Agriculture, Horticulture, and Forestry

Hungary — ***MNOSZ***
5 standards for seeds of oil producing plants — 6361, 6365
Sugar beet — 6375
Fodder beet — 6376

Ireland — ***Irish Standards***
Shovels, heavy duty — 50

Poland — ***PN***
3 standards for artificial fertilizers — C-87002/3;-87019

South Africa — ***SABS***
Standard specifications for forks and rakes — 390-1952

Spain — ***UNE***
Method for washing olives — 34304
Sugar-beet seeds — 34001

Sweden — ***SIS***
7 standards for different types of hand spades and shovels — SMS-1526, -1529 thru -1533, -1535
5 standards for farm wagons — SIS-35 92 02 thru -35 92 06

637 Produce from Domestic Animals

Netherlands — ***N***
Determination of density of buttermilk, etc with lacto-densimeter — 1358
Storch reaction for milk and liquid milk products — 1381

Poland — ***PN***
10 standards for butchers' tools — A-63001/04; -63011;-013/015;-017/8
Butcher's axe — A-63012
7 standards for different parts for agricultural machines — R-55015/6, 55045, 55108, 56121, 56123, 58007

South Africa — ***SABS***
Standard specification for tinned steel cans for milk and cream — 345-1951

United Kingdom — ***BS***
Capacity of cylindrical glass milk bottles — 1925:1953

638 Breeding of Insects and Reptiles

United Kingdom — ***BS***
Grading of honey — 1920:1952
Honey extractors, strainers and bottling tanks — 1890:1952

662.6/.9 Fuel Industry. Industrial Heating

Germany — ***DIN***
Conradson test method of fuel and lubricating oils — 51551
Sampling of fuel and lubricating oils — 51750
Flash-point test by Abel-Pensky method — 51755
Sulfuric acid test — 51762

Hungary — *MNOSZ*

Sampling coal and determination of its calorific value	3200

Netherlands — *N*

Sampling and preparation of test pieces for analysis of coal	3010

South Africa — *SABS*

Standard specification for fuel oil for high-speed compression-ignition engines	342-1952

Spain — *UNE*

Characteristics of solid fuels	9007

Sweden — *SIS*

Quality acceptance tests for motor fuels	SIS-15 10 04

United Kingdom — *BS*

Corrugated furnaces for cylindrical boilers	1971:1953

663 Technical Microbiology. Beverages

Mexico — *DGN*

"Habanera" liquor	R 14
Malt for brewery	R 20
Rum	F 24

Poland — *PN*

Test for chlorine ion	C-04552
Test for sulfur ion	C-04561
4 standards for drinking and industrial water	C-04554/6, 04571

664 Preparation and Preservation of Solid Foodstuff

Germany — *DIN*

Rollers for closing preserve tin cans up to 99mm in diameter	2033

Hungary — *MNOSZ*

Fourteen standards for differerent vegetable and fruit preserves	1810,-12, 1814/6, 1820/24, 1832/4, 1839

Mexico — *DGN*

Canned tomatoes	F-17
Pea preserves	F-28
Fruit cocktail preserves	F-29
Macedoine preserves	F-31

Poland — *PN*

6 standards for different grades of flour	A-74000; -74002/3;-74005/6;-74010

South Africa — *SABS*

Specification for canned tongue	273-1950
Specification for canned corned beef	274-1950
Specification for canned asparagus soup	277-1950
Standard specification for commercial dextrose and liquid glucose	388-1952
Standard specification for commercial lactose	389-1952
Standard specification for canners' sucrose	420-1952
Standard specification for canned ham	290-1951
Specification for canned tomato juice	279-1950
Standard specification for canned sliced bacon (cooked)	291-1951
Standard specification for mayonnaise and salad cream or dressing	300-1951
Standard specification for tomato sauce or ketchup	301-1951
Standard specification for cucumber pickles	302-1951
Standard specification for Worcestershire sauce	303-1951

664.7 Flour Milling

Poland — *PN*

Five standards for different grain products	A-74008, 74015, 74017/8, 74153
Three standards for different fodder	R-64766/7, 64771

Spain — *UNE*

Wheat flour	34400

665 Oils. Fats. Waxes

Germany — *DIN*

Diesel fuels, minimum specifications	81160
Otto motor fuel, minimum specifications	81161

Netherlands — *(Temporary) V*

Determination of penetrating properties of grease	3023
Greases. Determination of the drop point	1950

Poland — *PN*

4 standards for different petroleum products	C-04010, 04012, 96141, 96170

South Africa — *SABS*

Standard specification for petroleum jelly (petrolatum)	394-1952
Standard specification for motor fuel (petrol)	299-1951
Standard specification for raw tung oil	323-1951
Standard specification for solvent segregated pilchard oil	335-1952

Spain — *UNE*

Determination of viscosity with Saybolt viscosimeter	7066

United Kingdom — *BS*

Sunflower seed oil	1939:1953
Sampling fats and fatty oils	627:1953

668 Various Organic Chemical Industries

Australia — *A.S.*

Interim specification for adhesives for fruit case labels	Int 370, Jan 1953

Hungary — *MNOSZ*

3 standards for technical chemicals (phenol, cresol, napthalene)	776/8

Ireland — *Irish Standards*

Edible gelatine	37

United Kingdom — *BS*

Benzoles	135:1953
Coal-tar naphthas	479:1953
Toluoles	805:1953

677 Textile Industry

Austria — *ÖNORM*

Different wire ropes used in oil fields	M 9536
Five types of wire ropes used in mines	M 9535

Germany — *DIN*

2 standards for textile machine parts	64119, 64910
Washing of raw and scoured wool	95645, 95646
Determination of insect resistance of wool and other keratin-containing materials	95902
Evaluation of the degree of resistance to moths and insects of woolen and other keratin-containing materials	95910, 95911
Determination of crimpness	96418
Determination of water absorption	98581

683 Hardware. Ironmongery

India — *I.S.*

Hasps and staples, safety and wire types	363
Fanlight catches	364

New Zealand — *NZSS*

Standard specification for mild steel sash pulleys with brass wheels	911, Sept 1951

691 Building Materials

Austria — *ÖNORM*

Testing of field stones	B 3125, 3127

Canada — *CSA*

Specification for structural timber	043-1953

Germany — *DIN*

Ceramic wall and floor tiles	18154

India — *I.S.*

Coarse and fine aggregates for concrete	383

Ireland — *Irish Standards*

Hollow concrete building blocks	40:1953
Gypsum plasterboard	41:1952

Israel — *SI*

Quicklime	75

Netherlands — *N*

Lime, definition and test requirements	931

United Kingdom — *BS*

Methods of testing concrete	1881:1952
Air-cooled blastfurnace slag —coarse aggregate for concrete	1047:1952

693/695 Site Construction. Assembly. Various Trades

Australia — *A.S.*

Interim specification (Housing series) for wooden door frames and door jamb linings	Int 322, Aug 1952

New Zealand — *NZSS*

Standard specification for earthenware roofing tiles	794, Jan 1952
Standard specification for concrete roofing tiles	795, May 1951
Standard specification for profiles of mouldings and joinery	496, June 1952

Poland — *PN*

Plasterwork, technical requirements for	B-06080

United Kingdom — *BS*

Wood door frames and linings	1567:1953

AMERICAN STANDARDS

Status as of June 24, 1953

Legend

Standards Council—Approval of Standards Council is final approval as American Standard; usually requires 4 weeks.

Board of Review—Acts for Standards Council and gives final approval as American Standard; action usually requires 2 weeks.

Standards Boards—Approve standards to send to Standards Council or Board of Review for final action; approval by standards boards usually take 4 weeks.

Acoustics

In Electrical Standards Board—

Speech Audiometers, Specification for, Z24.13
Sponsor: Acoustical Society of America

Arbitration

In Miscellaneous Standards Board—

Commercial Arbitration, Standards for
Submitted by: American Arbitration Association

Building and Construction

American Standards Published—

Hollow Load-Bearing Concrete Masonry Units, Specifications for, ASTM C90-52; ASA A79.1-1953 $0.25

Hollow Non-Load-Bearing Concrete Masonry Units, Specifications for, ASTM C129-52; ASA A80.1-1953 (Revision of ASTM C129-39; ASA A80.1-1942) $0.25
Sponsor: American Society for Testing Materials

In Construction Standards Board—

Building Code Requirements and Good Practice Recommendations for Masonry, A41.1 (Revision of A41.1-1944)

Building Code Requirements for Minimum Design Loads in Buildings and Other Structures, A58.1
Sponsor: National Bureau of Standards

Reaffirmation Being Considered by Construction Standards Board—

Manhole Frames and Covers, for Subsurface Structures, A35.1-1941 (Reaffirmed 1947)
Sponsor: Construction Standards Board

Chemical Industry

In Miscellaneous Standards Board—

Method of Test for Toluene Insoluble Matter in Rosin, ASTM D269-52; ASA K21.1 (Revision of ASTM D269-30; ASA K21.1-1936)
Sponsor: American Society for Testing Materials

Drawings and Symbols

Reaffirmation Being Considered by the Graphic Standards Board—

Graphical Symbols for Heating, Ventilating, and Air Conditioning, Z32.2.4

Graphical Symbols for Welding, Z32.2.1
Sponsors: American Society of Mechanical Engineers; American Institute of Electrical Engineers

Electrical

American Standards Published—

Alternating-Current Power Circuit Breakers, Guide Specifications for C37.12-1952 $0.60

Interrupting Rating Factors for Reclosing Service on Power Circuit Breakers, C37.7-1952 (Revision of C37.7-1945) $0.30

Rated Control Voltages and Their Ranges for Power Circuit Breakers, C37.8-1952 (Revision of C37.8-1945) $0.30
Sponsor: Electrical Standards Board

In Board of Review—

Cotton Covered Round Copper Magnet Wire, C9.2 (Revision of C8.5-1936)

Enamel Coated Round Copper Magnet Wire, C9.1 (Revision of C8.7-1936)

Nylon Fibre Covered Round Copper Magnet Wire, C9.4

Silk Covered Round Copper Magnet Wire, C9.3 (Revision of C8.6-1936)
Sponsor: National Electrical Manufacturers Association

In Electrical Standards Board—

Flexible Cord and Fixture Wire, C33.1
Sponsor: Underwriters' Laboratory

Grounding Caps and Receptacles Rated 15 Amperes, 250 Volts and 30 Amperes 250 Volts, Requirements for, C73b (Revision of C73b-1951)

Grounding-Type Attachment Plug Caps and Receptacles, C73a (Revision of C73a-1950)
Sponsor: National Electrical Manufacturers Association

Fuels

In Board of Review—

Definitions of the Terms Gross Calorific Value and Net Calorific Value of Solid and Liquid Fuels, ASTM D407-44; ASA Z67.1
Sponsor: American Society for Testing Materials

Gas-Burning Appliances

In Miscellaneous Standards Board—

Addenda to Approval Requirements for Domestic Gas Ranges (Z21.1-1952), Z21.1a

Addenda to Approval Requirements for Domestic Gas-Fired Incinerators (Z21.6-1949), Z21.6a

Addenda to Approval Requirements for Gas-Fired Room Heaters (Z21.11-1949), Z21.11b

Addenda to Approval Requirements for Gas Unit Heaters (Z21.16-1951), Z21.16a

Approval Requirements for Central Heating Gas Appliances, Volume IV, Gravity and Fan Type Vented Recessed Heaters, Z21.13.4 (Revision of Z21.13.4-1951)

Approval Requirements for Domestic Gas Clothes Dryers, Z21.5 (Revision of A21.5-1940)

Approval Requirements for Gas Water Heaters, Z21.10 (Revision of Z21.10-1950, Z21.10a-1951, and Z21.10b-1952)
Sponsor: American Gas Association, Inc

Reaffirmation Being Considered by Miscellaneous Standards Board—

Attachable Gas Water Heating Units, Listing Requirements for, Z21.26-1941 (Reaffirmed 1947, 1950)

Draft Hoods, Listing Requirements for, Z21.12-1937 (Reaffirmed 1947, 1950)

Furnace Temperature Limit Controls and Fan Controls, Listing Requirements for, Z21.29-1941 (Reaffirmed 1947, 1950)

Gas Appliance Connectors of Flexible Metal Tubing and Fittings, Listing Requirements for, Z21.32-1942 (Reaffirmed 1947, 1950)

Gas Appliance Thermostats, Listing Requirements for, Z21.23-1940 (Reaffirmed 1947, 1950)

Gum Protective Devices, Listing Requirements, Z21.35-1945 (Reaffirmed 1950)

Installation of Gas Equipment in Large Boilers, Requirements for, Z21.33-1950

Refrigerators Using Gas Fuel, Requirements for, Z21.19-1941 (Reaffirmed 1947, 1950)

Relief and Automatic Gas Shut-Off Valves for Use on Water Heating Systems, Listing Requirements for, Z21.22-1935 (Reaffirmed 1947, 1950)

Semi-Rigid Gas Appliance Tubing and Fittings, Listing Requirements for, Z21.24-1941 (Reaffirmed 1947)
Sponsor: American Gas Association, Inc

Materials and Products

American Standard Published—

Thermal Analysis of Metals and Alloys, Tentative Recommended Practice for, ASTM E14-51 T; ASA Z30.2-1953 $0.25
Sponsor: American Society for Testing Materials

American Standards Approved—

Brass Wire, Specifications for, ASTM B134-52; ASA H32.1-1953 (Second edition) (Revision of ASTM B134-51; ASA H32.1-1953)

Bronze Castings in the Rough for Locomotive Wearing Parts, Specifications for, ASTM B55-52; ASA H28.1-1953 (Revision of ASTM B66-49; ASA H28.1-1949)

Car and Tender Journal Bearings, Lined, Specifications for, ASTM B67-52; ASA H29.1-1953 (Revision of ASTM B67-49; ASA H29.1-1949)

Copper and Copper Base Alloy Forging Rod, Bar, and Shapes, Specifications for, ASTM B124-52; ASA H7.1-1953 (Second edition) (Revision of ASTM B124-51; ASA H7.1-1953)

Free-Cutting Brass Rod and Bar for Use in Screw Machines, Specifications for, ASTM B16-52; ASA H8.1-1953 (Second edition) (Revision of ASTM B16-51; ASA H8.1-1953)

Leaded Red Brass (Hardware Bronze) Rod, Bar, and Shapes, Specifications for, ASTM B140-52; ASA H33.1-1953

(Second edition) (Revision of ASTM B140-51; ASA H33.1-1953)

Rolled Copper-Alloy Bearing and Expansion Plates and Sheets for Bridge and Other Structural Uses, Specifications for, ASTM B100-52; ASA H31.1-1953 (Revision of ASTM B100-49; ASA H31.1-1949)

Seamless Copper Pipe, Standard Sizes, Specifications for, ASTM B42-52; ASA H26.1-1953 (Second edition) (Revision of ASTM B42-51; ASA H26.1-1953)

Seamless Red Brass Pipe, Standard Sizes, Specifications for, ASTM B43-52; ASA H27.1-1953 (Second edition) (Revision of ASTM B43-51; ASA H27.1-1953)

Sponsor: American Society for Testing Materials

Mechanical

American Standards Published—

Compressed Gas Cylinder Valve Outlet and Inlet Connections, Amended Standards for, B57.1-1953 (Revision of B57.1-1950) $1.50

Sponsor: Compressed Gas Association

Involute Spline and Serration Gages and Gaging, B5.31-1953 (Revision of B5.15-1950) $1.25

Sponsors: American Society of Mechanical Engineers; Metal Cutting Tool Institute; National Machine Tool Builders' Association; Society of Automotive Engineers

Letter Symbols for Meteorology, Y10.10-1953 $1.00

Sponsor: American Society of Mechanical Engineers

Safety Code for Mechanical Power-Transmission Apparatus, B15.1-1953 (Revision of B15-1927) $1.00

Sponsors: Association of Casualty and Surety Companies; International Association of Governmental Labor Officials; American Society of Mechanical Engineers

Spindle Noses and Arbors for Milling Machines, B5.18-1953 $1.00

Sponsors: American Society of Mechanical Engineers; Society of Automotive Engineers; National Machine Tool Builders' Association; Metal Cutting Tool Institute

Supplement No. 1 to American Standard Code for Pressure Piping, B31.1a-1953 $1.00

Sponsor: American Society of Mechanical Engineers

American Standard Approved—

Small Solid Rivets, B18.1-1953 (Revision of American Standard Small Rivets, B18a-1927; B18a1-1942; and Tinners', Coopers', and Belt Rivets, B18g-1929; B18g1-1942)

Sponsors: Society of Automotive Engineers; American Society of Mechanical Engineers

Projects Being Considered for Initiation—

Industrial Diamonds and Accessories for Their Use, B67

Sponsors: American Society of Tool Engineers; Industrial Diamond Association of America

Performance Standards for Small Sawmills, B66

Sponsor: American Society of Mechanical Engineers

Reaffirmation Being Considered by Miscellaneous Standards Board—

Indicating Pressure and Vacuum Gages, Round, Dial-Type with Elastic Pressure Chamber, B40.1-1939 (Reaffirmed 1947)

Sponsor: American Society of Mechanical Engineers

Motion Pictures

In Photographic Standards Board—

Sixteen-Millimeter Motion Picture Projection Reels, PH22.17 (Revision of PH22.11-1952)

Sponsor: Society of Motion Picture and Television Engineers

Optics

American Standard Published—

Nomenclature for Radiometry and Photometry, Z58.1.1-1953 $0.25

Sponsor: Optical Society of America

Paints and Varnishes

In Miscellaneous Standards Board—

Method of Test for Mass Color and Tinting Strength of Color Pigments, ASTM D387-52; ASA K57 (Revision of ASTM D387-36; ASA K57-1941)

Methods of Test for Specific Gravity of Pigments, ASTM D153-52; ASA K41 (Revision of ASTM D153-39; ASA K41-1939)

Sponsor: American Society for Testing Materials

Petroleum Products and Lubricants

American Standard Published—

Test for Flash Point by Tag Closed Tester, ASTM D56-52; ASA Z11.24-1952 (Revision of ASTM D56-51; ASA Z11.24-1951) $0.25

Sponsor: American Society for Testing Materials

Photography

In Board of Review—

Attachment Threads for Lens Accessories, Specifications for, PH3.12 (Revision of Z38.4.12-1944)

Contact Printers, Specifications for, PH3.8 (Revision of Z38.7.10-1944)

Dimensions for Photographic Paper Rolls, PH1.11 (Revision of Z38.1.5-1943 and partial revision of Z38.1.6-1943)

Dimensions for Photographic Paper Sheets, PH1.12 (Partial revision of Z38.1.6-1943 and revision of Z38.1.43-1947)

Masks (Separate) for Use in Photographic Contact Printing of Roll Film Negatives, Specifications for, PH3.9 (Revision of Z38.7.12-1944)

Photographic Grade Ammonium Chloride (NH_4Cl), Specification for, PH4.183

Photographic Grade Ammonium Sulfate ($(NH_4)_2SO_4$, Specification for, PH4.184

Photographic Grade Blotters, PH4.10

Stereo Still Pictures on 35-Millimeter Film, PH3.11

Sponsor: Photographic Standards Board

In Miscellaneous Stand rds Board—

Method for Determining Exposure Guide Numbers for Photographic Lamps, PH2.4

Method for Determining the Relative Photographic Efficiency of Illuminants, PH2.3

Sponsor: Photographic Standards Board

Rubber

In Miscellaneous Standards Board—

Methods of Sample Preparation for Physical Testing of Rubber Products, ASTM D15-52T; ASA J1.1 (Revision of ASTM D15-41; ASA J1.1-1942)

Method of Tension Testing of Vulcanized Rubber, ASTM D412-51T; ASA J2.1 (Revision of ASTM D412-41; ASA J2.1-1942)

Method of Test for Accelerated Aging of Vulcanized Rubber by the Oven Method, ASTM D573-52; ASA J5.1 (Revision of ASTM D573-48; ASA J5.1-1949)

Method of Test for Accelerated Aging of Vulcanized Rubber by the Oxygen-Pressure Method, ASTM D572-52; ASA J4.1 (Revision of ASTM D572-48; ASA J4.1-1949)

Sponsor: American Society for Testing Materials

Safety

American Standard Approved—

Safety Code for Private Residence Elevators, A17.1.5-1953

Sponsors: American Institute of Architects; National Bureau of Standards; American Society of Mechanical Engineers

Textiles

American Standard Published—

Methods of Testing Felt, ASTM D461-51; ASA L14.52-1953 (Revision of ASTM D461-50; ASA L14.52-1951) $0.25

Sponsors: American Society for Testing Materials; American Association of Textile Chemists and Colorists

American Standards Approved—

Methods of Test for Asbestos Yarns, ASTM D299-52T; ASA L14.18-1953 (Revision of ASTM D299-50T; ASA L14.18-1951)

Methods of Test for Clean Wool Content of Wool in the Grease, ASTM D584-52T; ASA L14.40-1953 (ASTM D548-50; ASA L14.40-1951)

Methods of Test for Small Amounts of Copper and Manganese in Textiles, ASTM D377-52T; ASA L14.49-1953 (Revision of ASTM D377-47T; ASA L14.49-1949)

Methods of Testing Asbestos Tubular Sleeving, ASTM D628-52; ASA L14.41-1953 (Revision of ASTM D628-44; ASA L14.41-1949)

Methods of Testing Woven Asbestos Cloth, ASTM D577-52; ASA L14.35-1953 (Revision of ASTM D577-42; ASA L14.35-1949)

Methods of Testing and Tolerances for Certain Wool and Part Wool Fabrics, ASTM D462-52; ASA L14.28-1953 (Revision of ASTM D462-44; ASA L14.28-1949)

Methods of Testing and Tolerances for Cotton Yarns, ASTM D180-52T; ASA L14.13-1953 (Revision of ASTM D180-49T; ASA L14.13-1951)

Methods of Testing and Tolerances for Jute Rove and Plied Yarn for Electrical and Packing Purposes, ASTM D681-52; ASA L14.44-1953 (Revision of ASTM D681-48; ASA L14.44-1949)

Methods of Testing and Tolerances for Rope (Leaf and Bast Fibres), ASTM D738-52; ASA L14.45-1953 (Revision of ASTM D738-46; ASA L14.45-1949)

Methods of Testing and Tolerances for Single Jute Yarn, ASTM D541-52; ASA L14.34-1953 (Revision of ASTM D541-49; ASA L14.34-1951)

Methods of Testing and Tolerances for Spun, Twisted, or Braided Products Made from Flax, Hemp, Ramie, or Mixtures Thereof, ASTM D739-52; ASA L14.46-1953 (Revision of ASTM D739-46; ASA 114.46-1949)

Recommended Practice for Universal System of Yarn Numbering, ASTM D861-52; ASA L14.48-1953 (Revision of ASTM D861-50; ASA L14.48-1951)

Sponsors: American Society for Testing Materials; American Association of Textile Chemists and Colorists

What's New on American Standard Projects

Hypodermic Syringes and Needles—

Requested by: American National Red Cross.

Standards for hypodermic syringes and needles based on those used by the Armed Services Medical Procurement and Supply Agency including Federal Specifications of the Federal Supply Service have been recommended for acceptance as American Standard. The recommendation was made by a general conference of users and manufacturers of these supplies and allied interests.

In proposing that consideration be given to the initiation of a project, the American National Red Cross stressed the need for interchangeability of needles and syringes in disaster activities in this country as well as internationally.

Interchangeability is badly needed by the NATO countries and at the Korean front, the discussion indicated, since ambulances of different nations may have to cooperate. In such cases it is imperative that each needle shall fit each syringe.

Captain W. N. Montgomery, speaking at the conference in behalf of the Armed Services Medical Procurement Agency, said dependence on local supplies as supplementary equipment in the NATO countries might prove hazardous unless interchangeability is assured.

Acceptance of the Armed Services standards as American Standards, through procedures of ASA, may effectively serve as a preliminary step toward much needed international interchangeability, it was indicated. After approval as American Standard, the specifications will carry more weight when submitted to the International Organization for Standardization (ISO) as a proposal for international unification.

It was reported that in the United States interchangeability of the connections between the tips of syringes and the hubs of the needles exists in practice. Manufacturers generally follow the specifications established by the Armed Forces Medical Procurement Agency and the Federal Specifications in the production of syringes and needles. Only in cases where supplies of an exceptionally early vintage are used to supplement regular equipment is there apt to be lack of interchangeability. However, as pointed out at the conference, this situation may lead to difficulties even in the United States when a region is struck by disaster and there is lack of interchangeability between local supplies and those rushed to the aid of that region by the American Red Cross.

The conference anticipated that the specifications used by the Armed Forces could be readily transformed into specifications suitable as American Standard. Captain Montgomery accepted responsibility for the preparation of a draft of a proposed American Standard to be circulated to the interested groups for approval.

Wrought Iron and Wrought Steel Pipe and Tubing, B36—

Sponsors: American Society of Mechanical Engineers; American Society for Testing Materials.

At its meeting April 20, the Chemical Industry Advisory Board discussed the finish of austenite stainless steel pipe. This pipe is extensively used by the chemical industry for corrosion resistance and to avoid product contamination. As defects in long lengths of pipe cannot be seen it was suggested that the ASTM tentative standard specifications for austenite stainless steel pipe, for example, include information concerning defects that are cause for rejection and concerning permissible means for removal or repair of defects. The Board has therefore sent recommendations to ASTM that it consider adding quality control requirements to ASTM Tentative Specifications A312-51T.

Transformers, Regulators, and Reactors, C57—

Sponsor: Electrical Standards Committee.

John H. Chiles, Jr, Manager of Engineering for the Westinghouse Electric Corporation's Transformer Division at Sharon, Pa., has been named chairman of Sectional Committee C57, and John Cantwell, General Electric Company, Schenectady, New York, has been named secretary. The election took place at the annual meeting of the committee held in New York City during the recent mid-winter convention of the American Institute of Electrical Engineers.

The new chairman, Mr Chiles, has been a member of ASA C57 for approximately ten years. He succeeds F. L. Snyder, former chairman, who

resigned bcause his new assignments are no longer in the transformer field.

Mr Chiles has been active in the standardization work of the National Electrical Manufacturers Association for a number of years. During the war he headed a committee for the Bureau of Ships which resulted in standardization of dry-type distribution and instrument tranformers for shipboard use. He is a Fellow in the American Institute of Electrical Engineers, and is active in the AIEE Committee on Instruments and Measurements, the Committee on Transformers, and the various AIEE working subcommittees on transformers and related equipment.

• • **J. T. Ryan, Jr,** has been elected president of the Mines Safety Appliances Company, the world's largest safety equipment manufacturing firm. Mr Ryan is also representative of the Industrial Safety Equipment Association on ASA's Safety Standards Board.

• • **Vice Admiral George F. Hussey, Jr,** (USN, retired), Managing Director of ASA, has been elected president of the U. S. Naval Academy Alumni Association to serve a one-year term.

• • **The American Standards Association** has arranged with the International Organization for Standardization for USA to Participate in the work of ISO Technical Committee 37 on Terminology. This committee is concerned with general principles and methods of coordination of definitions, abbreviations, and bibliographies. A committee is now being organized by ASA to coordinate the U. S. viewpoint and to work with ISO/TC 37.

• • **Distribution of the 1951 revision of the National Electrical Code** required 87½ tons of paper for a total of 400,000 copies—*From the National Fire Protection Association, sponsor for project C1.*

Recent Publications Received from ASA Members

American Society of Heating and Ventilating Engineers
(62 Worth Street, New York 13, N. Y.)

The Heating Ventilating Air Conditioning Guide, 1953. (Thirty-first edition. April 1953). $7.50

American Society for Testing Materials
(1916 Race Street, Philadelphia 3, Pa.)

Standards on Copper and Copper Alloys (Compilation Revised March 1953) $5.00

ASTM Standards on Plastics (March 1953) $5.25

ASTM Manual on Industrial Water (First edition January 1953) $4.25

American Society of Refrigerating Engineers
(40 West 40 Street, New York, N. Y.)

Refrigeration Applications, 1952.

Refrigeration Fundamentals (Basic Volume), 1951.

General Motors Corporation
(Detroit 2, Michigan)

JIC [Joint Industry Conference] Hydraulic Standards for Industrial Equipment (Revised January, 1953. Published by General Motors Corporation). Available upon request to General Motors Production Engineering Section, General Motors Building, Detroit 2, Michigan.

Illuminating Engineering Society
(1860 Broadway, New York 23, N. Y.)

Recommended Practice for Supplementary Lighting (New Report.) $0.50

National Electrical Manufacturers Association
(155 East 44th Street, New York 17, N. Y.)

EEI-NEMA Standards for Distribution Transformers (Overhead Type), NEMA Publication No. 114-1953 (Revision of Fourth Report) $1.00

NEMA Definitions, Standards and Purchase Specifications for Marine-propulsion Steam Turbines and Gears, Publication No. MP1-1953 (Compilation. Revised 1953) $3.25

NEMA Standards for Land Gas Turbine Power Plants, Publication No. TU6-1953. $1.00

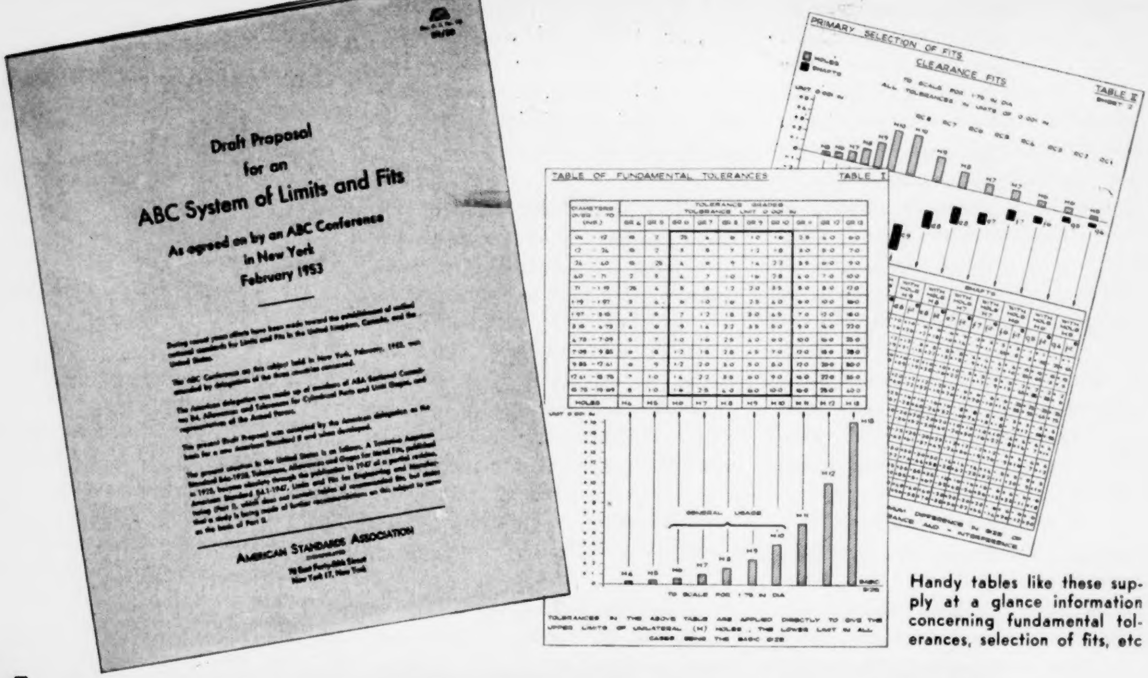
NEMA Standards for Metallic Rectifiers, Publication No. MR1-1953 (Revised May-June 1953) $3.50

Society for the Advancement of Management

Glossary of Terms Used in Methods, Time Study, and Wage Incentives. (Published 1952) $1.00

Society of Automotive Engineers, Inc
(29 West 39th Street. New York 18, N. Y.)

1953 SAE Handbook (New and revised. 1953)



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A Draft Proposal for an ABC System for Limits and Fits was agreed on by the American, British, and Canadian delegations, representing industry and the Armed Forces in their countries, at the ABC Conference on Limits and Fits, held in New York, February, 1953.

AMERICAN STANDARDS ASSOCIATION, INCORPORATED
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This proposal is intended to serve as the basis for such national standards as may be set up in each of the three countries, so that their practices may be unified.

Copies of the

Draft Proposal
for an
ABC System of Limits and Fits
(February, 1953)

are available from the ASA office.

Price: 75 cents a copy

This draft contains, among other things:

- Tables of Fundamental Tolerances
- Tables of Clearance, Transition, and Interference Fits
- Tables of Fits for Special Purposes
- Tables of Limits for Holes and Shafts

ALSO AVAILABLE:

Reprints of the article:

Does Industry Want American Standard Tables of Recommended Fits?
by Dr John Gaillard

This article explains how the ABC tables can be adapted to company use.

Price: 25 cents a copy